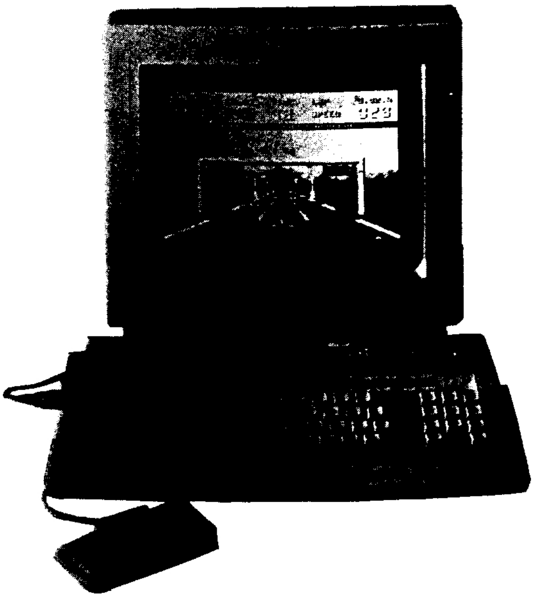
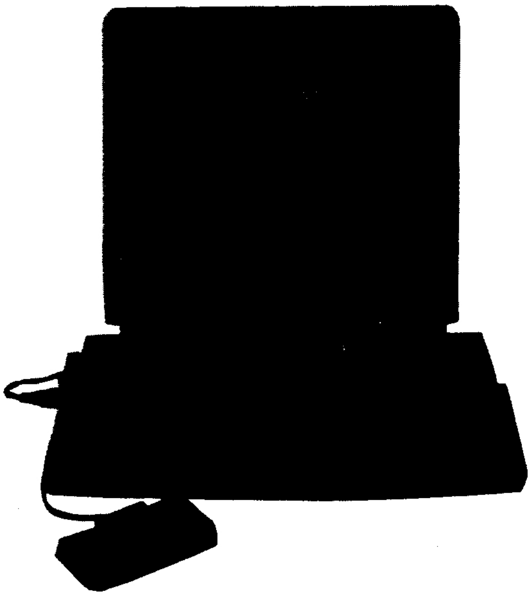
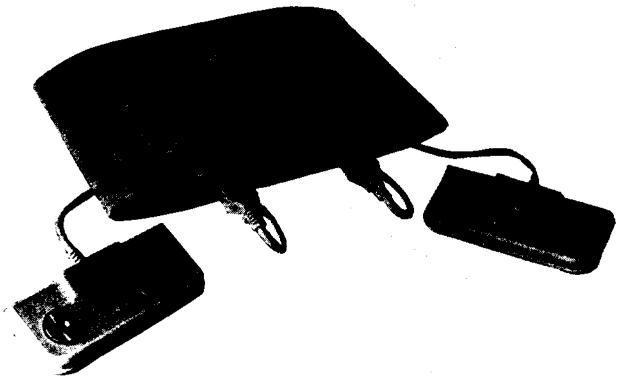
AMSTRAD







464 PLUS HOME COMPUTER
6128 PLUS HOME COMPUTER
GX4000 GAMES CONSOLE
MM 12 MONOCHROME MONITOR
CM 14 COLOUR MONITOR

SERVICE MANUAL

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NOTE TO ENGINEERS

Please Note: That RP11 Diagnostic Rom Cartridge is available to diagnose fault conditions on this range of home computers. Full instructions and analysis is made in the user instruction manual.

SAFETY TEST

All monitors are tested to the following specifications.

1. **Flash Test:** Test at 1.5kV RMS / 3 sec between the live and neutral poles of the mains lead and all accessible metal points on the exterior of the set.
2. **Insulation Resistance Test:** Test at 1.5kV RMS / 3 sec between the live and neutral poles of the mains lead and all accessible metal points on the exterior of the set to show a resistance greater than 4Mohms.
3. **Earth Continuity Test:** The resistance of the mains lead shall not exceed 0.5ohms.

PLEASE NOTE: When any work is completed on this unit, correct safety tests must be carried out to ensure continued electrical safety.

PLEASE NOTE: All parts shown with the part number prefix ⚠ are Safety Items and must be replaced with similar items having an identical safety specification.

All those items may be purchased direct from AMSTRAD plc.

In keeping with our policy of continually improving our service, and the technical quality of our products, we reserve the right to change component types, manufacturers, sources of supply or technical specification at any time.

AMSTRAD PLC
BRENTWOOD HOUSE, 169 KINGS ROAD, BRENTWOOD, ESSEX CM14 4EF.

464 PLUS TECHNICAL SPECIFICATION

LSI CHIPS

Z80A processor running at 4MHz.
64K of RAM (over 41K available when using BASIC).
128K byte ROM cartridge containing BASIC firmware and "Burnin' Rubber" game.
GI AY-3-8912 3 voice, 8 octave sound generator chip.
Application Specific Integrated Circuit (ASIC) containing 18,000 gates. Includes emulation of 6845 video controller and 8255 parallel peripheral interface. Chip also contains 16,000 bits of storage for sprite data.

DISPLAY SPECIFICATION (BASIC)

Display Mode	Mode 1	Mode 2	Mode 3
No. of colours	4 from 27	2 from 27	16 from 27
Vertical dots	200	200	200
Horiz. dots	320	640	160
Characters	40 × 25	80 × 25	20 × 25

DISPLAY SPECIFICATION (CARTRIDGE GAMES)

16 mode independent sprites are available in 16 different colours from those used to draw the main screen.
Both sprite colours and main screen colours may now be chosen from a palette of 4096. (16 levels of Red, Green and Blue).

Display Mode	Mode 1	Mode 2	Mode 3
No. of colours	4 from 4096	2 from 4096	16 from 4096
No. Sprites	16	16	16
Sprite colours	16 from 4096	16 from 4096	16 from 4096

EXTRA FEATURES (CARTRIDGE GAMES)

Analogue joystick support.
Soft Scroll allows pixel-wise movement in vertical and horizontal for fast action games.
Split Screen allows two separate areas to be displayed at once alleviating the need to re-draw score bars etc.
DMA driven sound allows tunes to play without processor intervention.
Raster Interrupt allows games to change mode and colours at fixed points on the screen.

KEYBOARD

74 keys – QWERTY style, numeric cluster, cursor and copy cursor, large enter, shift, caps lock, tab, escape, delete, clear, control.

DATACORDER

Write speed software selectable – 1K baud or 2K baud, read speed automatically established by software. Write protect interlock. Motor on/off controlled by software.

ADD-ON ABILITY

8 bit Centronics compatible printer.
1 or 2 digital joysticks or paddles.
IBM Standard analogue joystick. (Some cartridge games).
Light gun.
Various peripherals.
ROM cartridge up to 512K byte capacity.

EXTERNAL SOCKETS

3.5 mm stereo jack plug for connection to external amplifier.
2 × 9 Pin D-type digital paddle/joystick connectors.
15 Pin D-type analogue joystick connector (IBM Standard).
RJ11 "telephone" jack for connection of light gun.
25 way D-type connector for 8 bit Centronics interface.
50 way Amphenol style connector with full Z80 bus for addition of other devices (e.g. serial interface).
8 Pin DIN socket for RGB, sync, Luminance and stereo sound connection to monitor.
5 mm socket for connection of 5V power supply for monitor.

DIMENSIONS mm (approx.)

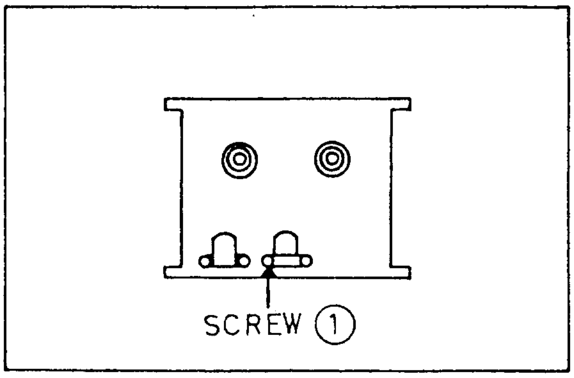
	Width	Height	Depth
Computer	398	46	297
MM12 mono motor	329	308	307
CM14 colour monitor	377	348	360
Paddle controller	124	22	56

POWER SUPPLY
MM12 Monitor: 240V AC (UK), 220V AC (Europe) 50Hz.
CM14 Monitor: 220-240V AC 50Hz.

ELECTRICAL ADJUSTMENTS

AZIMUTH

1. Connect the probe of oscilloscope to jumper line Ⓐ.
2. Insert the tast tape(MTT-113, 6.34KHz) for adjustment into the deck.
3. Press the PLAY button to operate the tape.
4. Adjust the screw ① to maximize the waveform as shown below.



LUMI. SIGNAL OUTPUT LEVEL

1. Connect the oscilloscope to 3 pin of J102.
2. Adjust VR101 so that the signal becomes 1.65V as shown in Fig. 1.

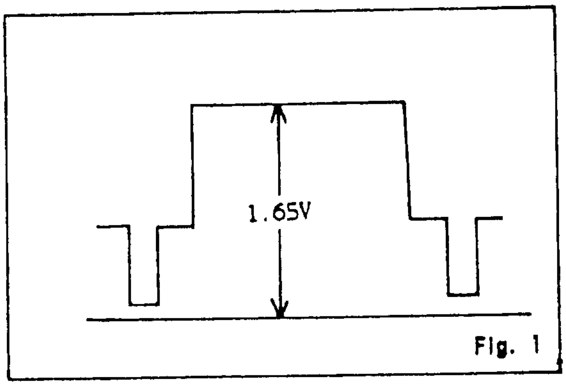
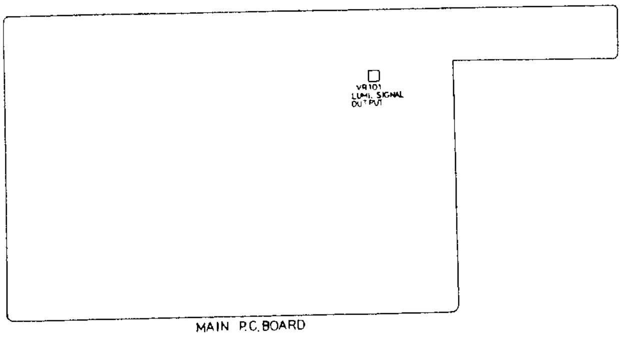
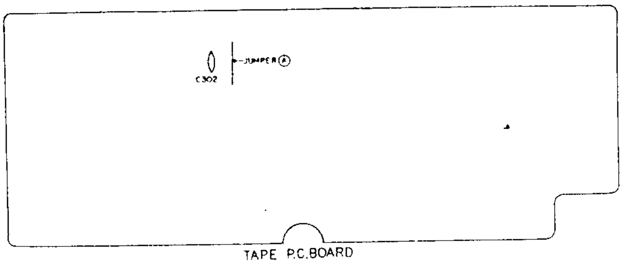


Fig. 1

MAJOR COMPONENTS LOCATION GUIDE



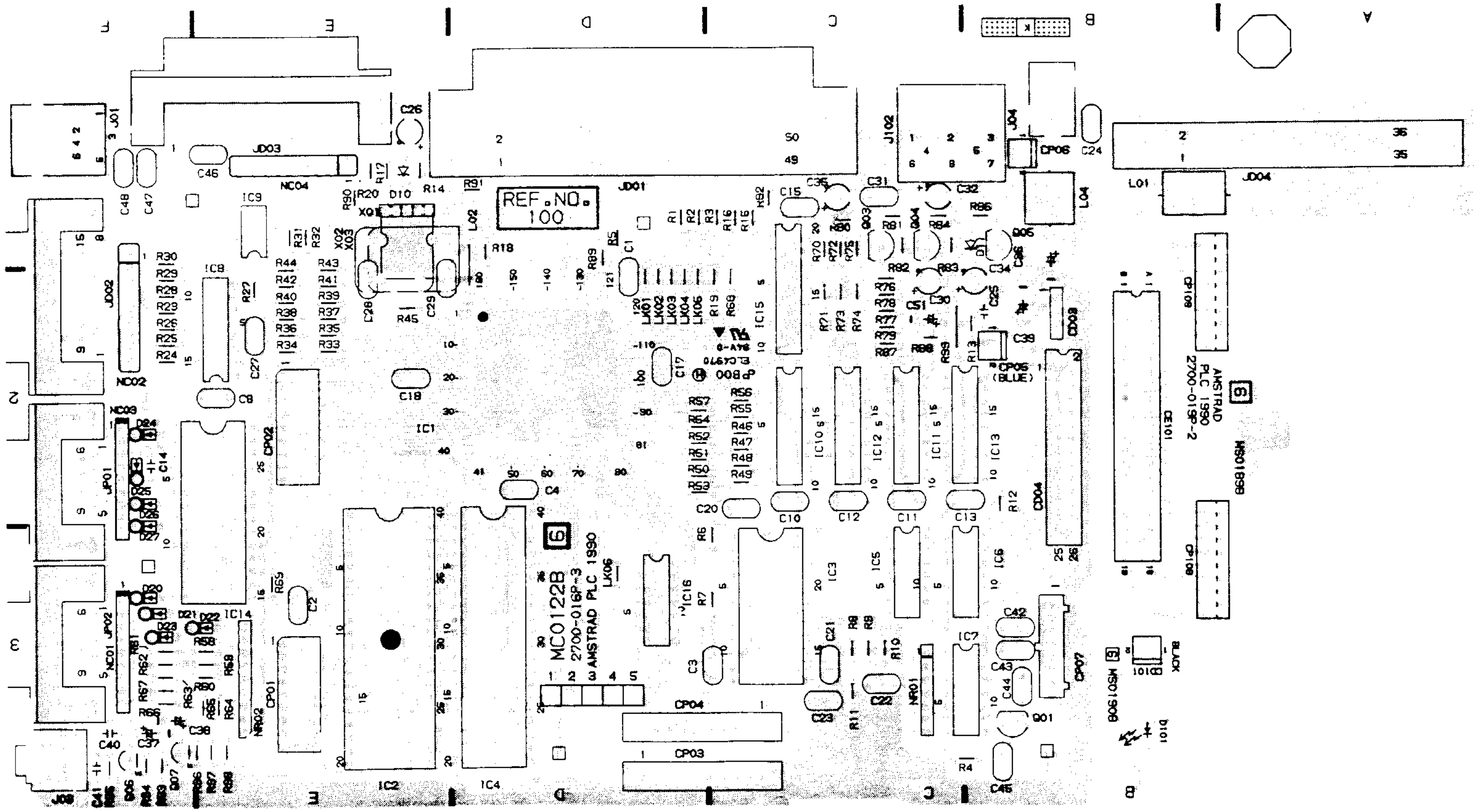
MAIN P.C.BOARD



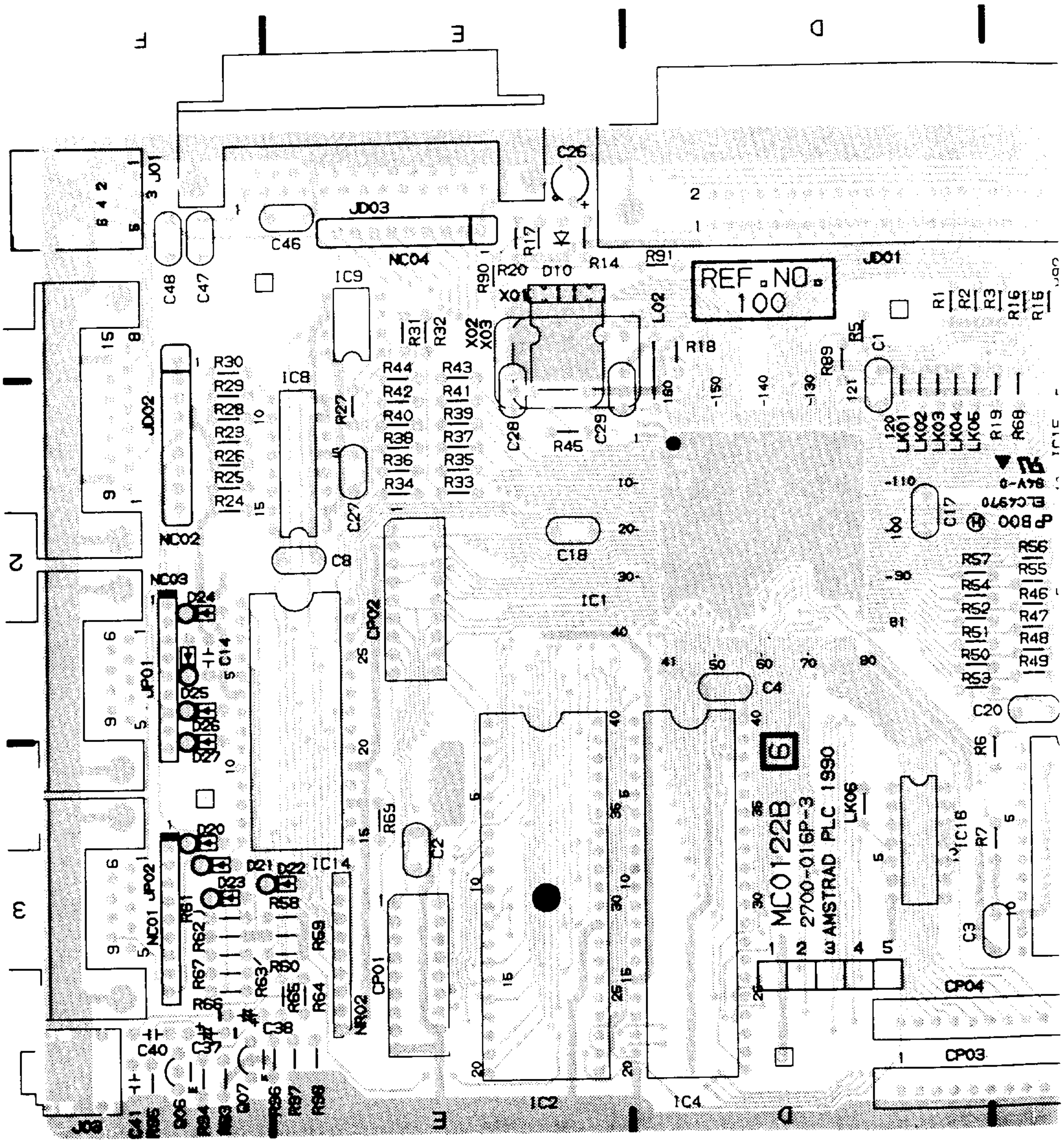
TAPE P.C.BOARD

MAIN/CASSETTE HOLD/LED

TOP


A
B
C
D
E
F
2
3
MC0122B
2700-016P-3
AMSTRAD PLC 1990
AMSTRAD
PLC 1990
2700-019P-2
MS01898
MS01908
REF.NO.
100
BLACK
CP05
(BLUE)
IC1
IC2
IC4
JD01
JD02
JD03
JD04
J102
CE101
CP01
CP02
CP03
CP04
CP07
CP108
CP109
D101

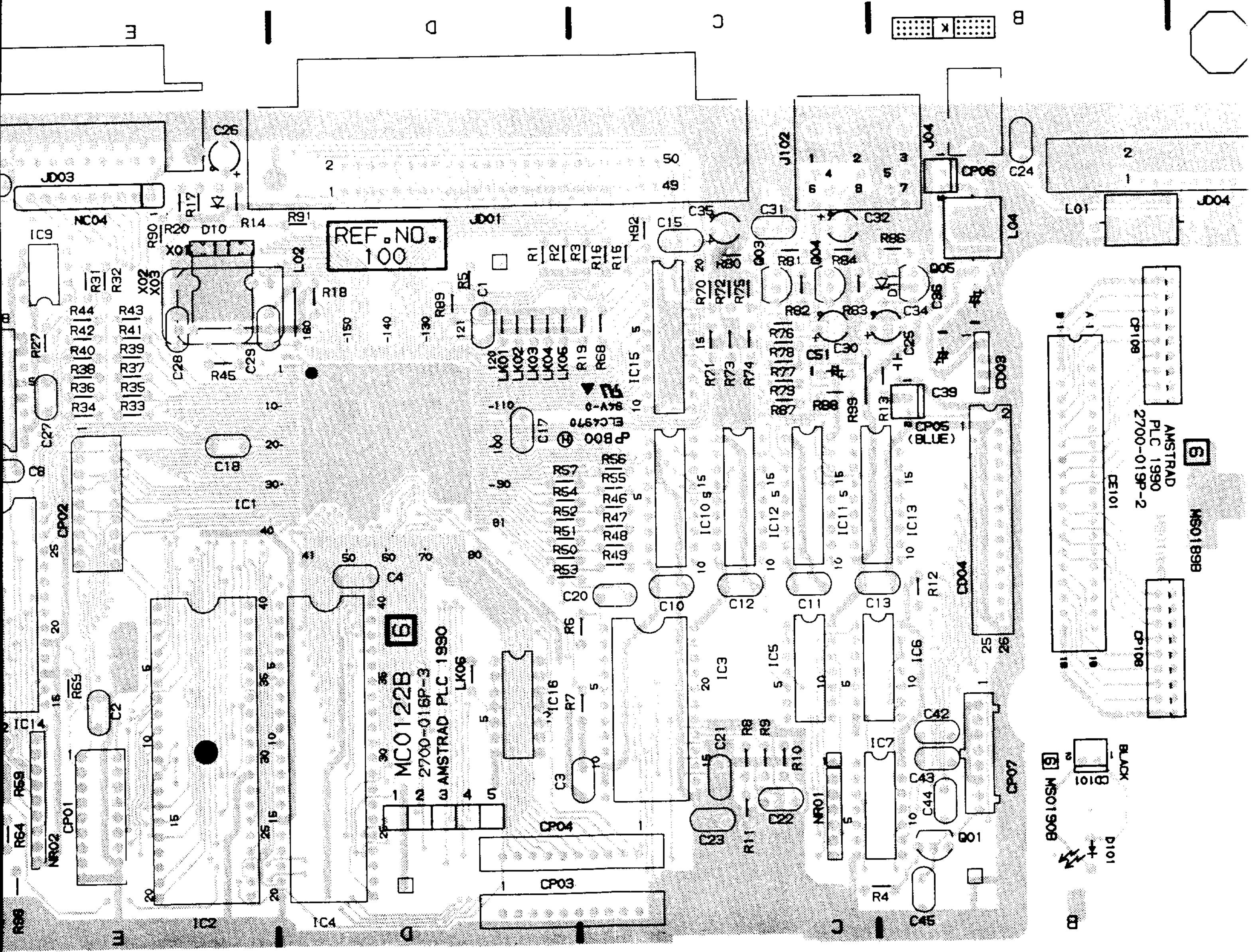
MAIN/CASSE



REF. NO.
100
MC0122B
2700-016P-3
AMSTRAD PLC 1990
JD01
JD02
JD03
JP01
JP02
J01
J03
NC01
NC02
NC03
NC04
NR02
CP01
CP02
CP03
CP04
IC1
IC2
IC4
IC8
IC9
IC14
IC16
X01
X02
X03
L02
D10
D21
D24
D25
D27
C1
C2
C3
C4
C8
C14
C17
C18
C20
C26
C27
C28
C29
C37
C38
C40
C41
C46
C47
C48
R1
R2
R3
R5
R6
R7
R14
R16
R17
R18
R19
R20
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
R33
R34
R35
R36
R37
R38
R39
R40
R41
R42
R43
R44
R45
R46
R47
R48
R49
R50
R51
R52
R53
R54
R55
R56
R57
R58
R59
R60
R61
R62
R63
R64
R65
R66
R67
R68
R69
R89
R90
R91
LK01
LK02
LK03
LK04
LK06
Q06
Q07
94V-0
D
E
F
2
3
1
2
3
4
5

MAIN/CASSETTE HOLD/LED

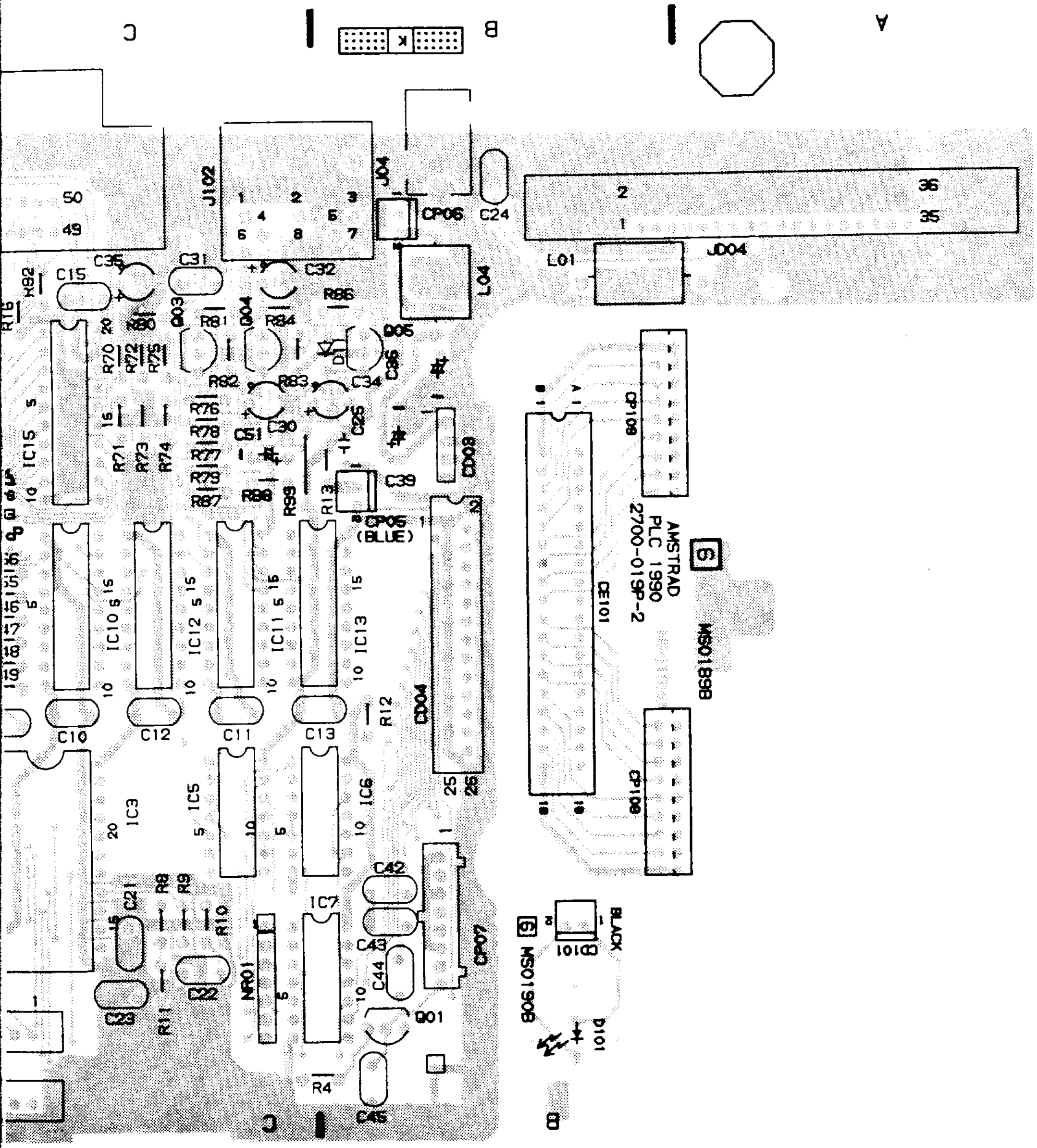
TOP



E
D
C
B
REF.NO.100
JD01
JD03
JD04
NC04
J102
J04
CP06
CP05 (BLUE)
CP01
CP02
CP03
CP04
CP07
CP08
CP09
CD03
CD04
CE101
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
X01
X02
X03
L01
L02
L04
D10
D101
B101
BLACK
Q01
Q03
Q04
Q05
NR01
NR02
LK01
LK02
LK03
LK04
LK05
LK06
MC0122B
2700-016P-3
AMSTRAD PLC 1990
AMSTRAD PLC 1990 2700-019P-2
MS0189B
MS0190B

ETTE HOLD/LED

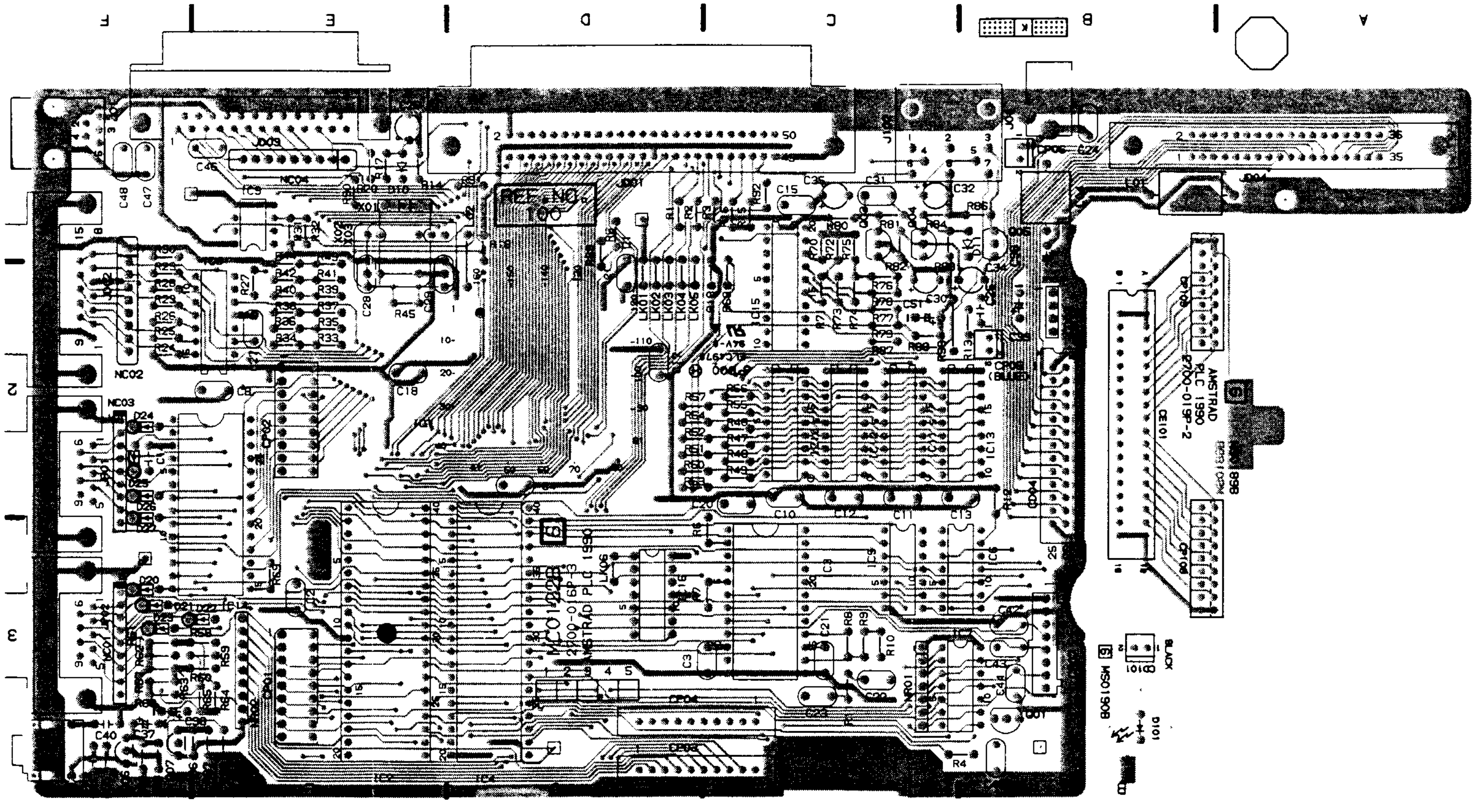
TOP



C
B
A
J102
J04
CP06
C24
JD04
L01
L04
50
49
C15
C35
C31
C32
R86
Q03
Q04
Q05
R81
R84
R70
R72
R75
R80
R82
R83
C34
C36
C30
C25
C51
R76
R78
R77
R79
R87
R88
R99
R13
C39
CP05
(BLUE)
CD03
CP109
CP108
CE101
AMSTRAD
PLC 1990
2700-01SP-2
MS01898
IC15
IC10
IC12
IC11
IC13
CD04
R12
C10
C12
C11
C13
IC3
IC5
IC6
IC7
C42
C43
C44
CP07
C21
R8
R9
R10
R11
C22
C23
NR01
Q01
R4
C45
BLACK
D101
MS01908
R71
R73
R74
R92

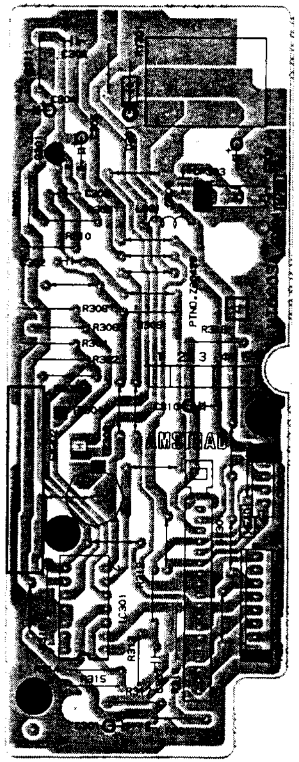
MAIN/CASSETTE HOLD/LED

BOTTOM



A
B
C
D
E
F
1
2
3
AMSTRAD
PLC 1990
2700-019P-2
CE101
CP105
CP106
MS01898
BLACK
D101
MS01908
MC01828
2200-016P-3
AMSTRAD PLC 1990
REF.NO.
100
IC15
IC13
C18
C28
C10
C12
C11
C13
NC02
NC03
NC04
CP01
CP02
CP03
CP04

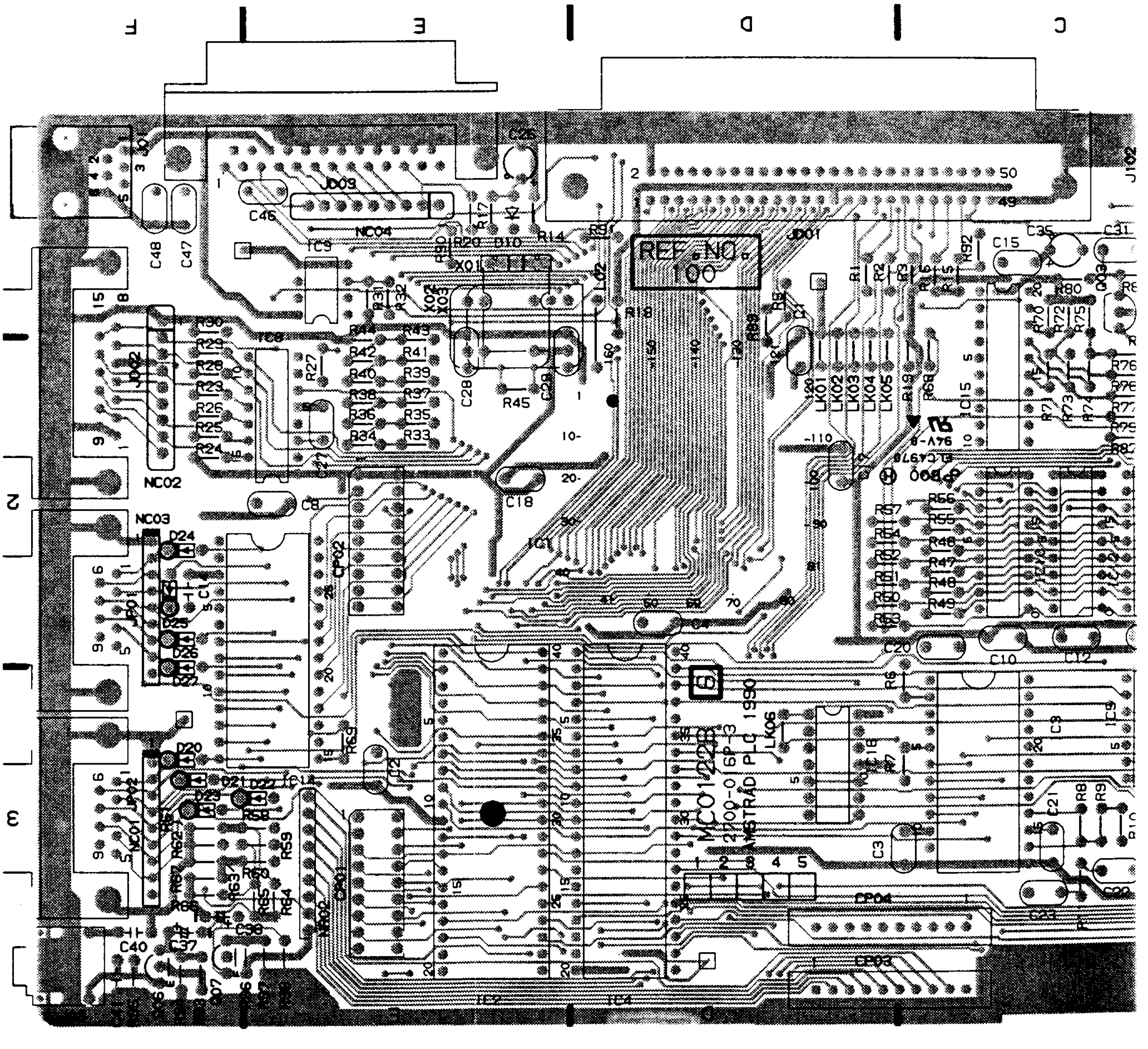
TAPE



AMSTRAD
R306
R308
IC301

MAIN/CASSE

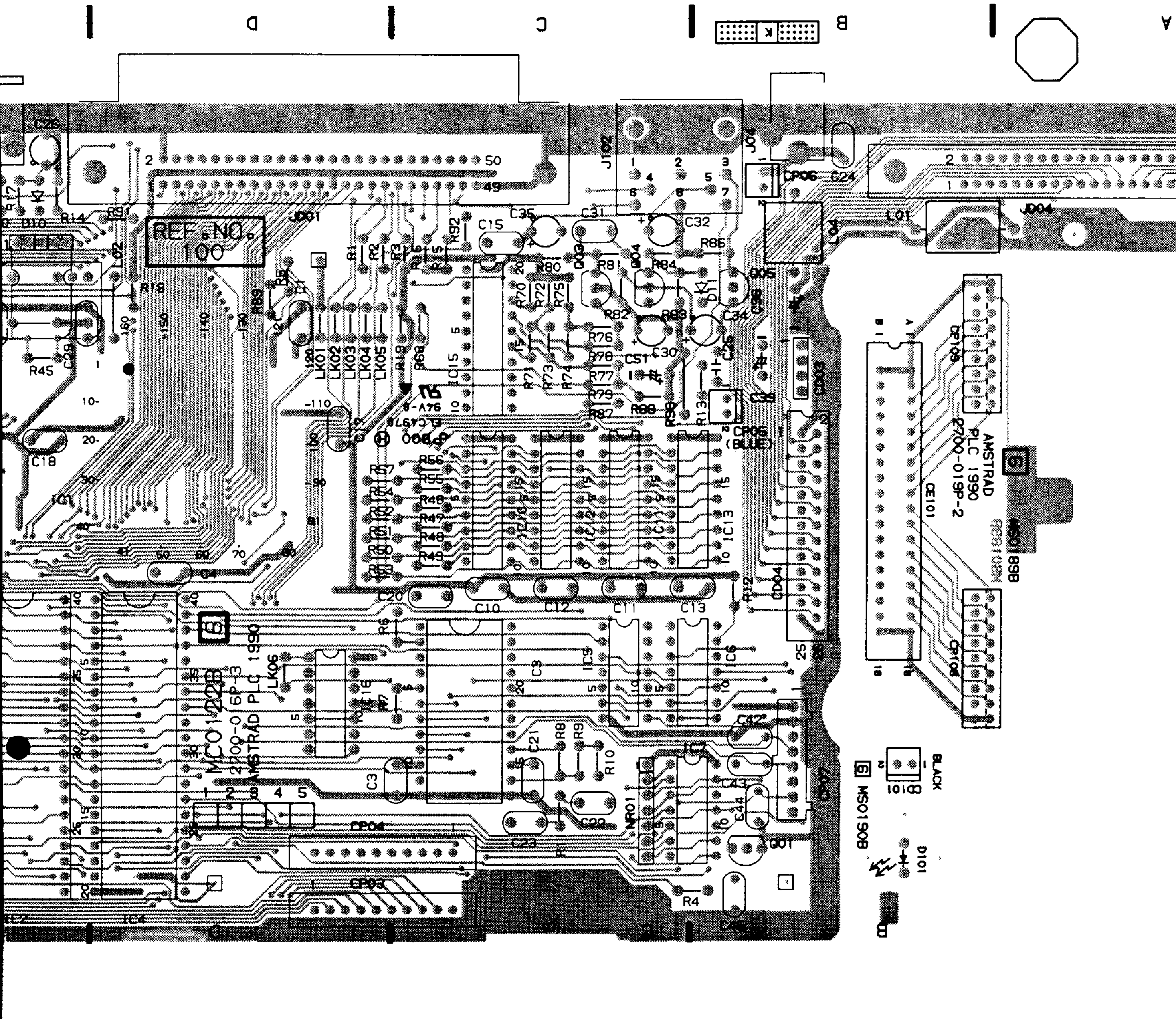
B



F
E
D
C
REF. NO. 100
JD01
JD02
JD03
NC01
NC02
NC03
NC04
CP01
CP02
CP03
CP04
IC1
IC2
IC4
IC5
IC8
IC9
IC15
X01
X02
X03
MC0122B
2700-016P-3
AMSTRAD PLC 1990
LK01
LK02
LK03
LK04
LK05
LK06
1
2
3

MAIN/CASSETTE HOLD/LED

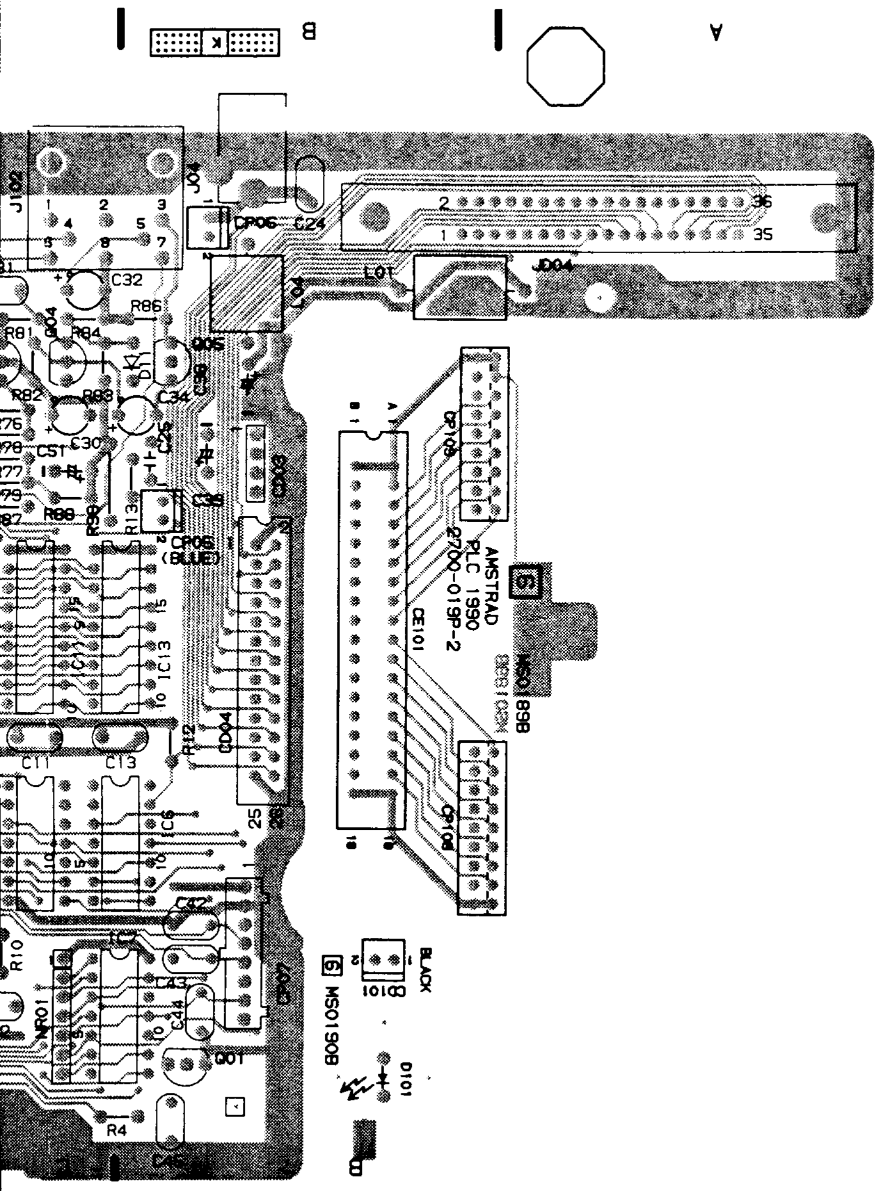
BOTTOM



A
B
C
D
REF. NO. 100
JD01
J102
J104
JD04
CP06
CP05 (BLUE)
CP07
CP04
CP03
CP101
CP106
CD03
CD04
CE101
L01
L04
IC1
IC2
IC4
IC3
IC5
IC6
IC7
IC9
IC10
IC11
IC12
IC13
IC15
IC16
C4
C10
C11
C12
C13
C15
C18
C20
C21
C22
C23
C24
C26
C29
C30
C31
C32
C34
C35
C36
C39
C42
C43
C44
C51
D1
D101
Q01
Q02
Q03
Q04
Q05
R1
R2
R3
R4
R6
R7
R8
R9
R10
R12
R13
R14
R15
R16
R18
R19
R45
R47
R48
R49
R50
R53
R54
R55
R56
R57
R58
R68
R70
R71
R72
R73
R74
R75
R76
R77
R78
R79
R80
R81
R82
R83
R84
R86
R87
R88
R89
R91
R92
LK01
LK02
LK03
LK04
LK05
LK06
NR01
MC0122B
2700-016P-3
AMSTRAD PLC 1990
AMSTRAD
PLC 1990
2700-019P-2
MS0189B
MS0190B
BLACK
94V-0

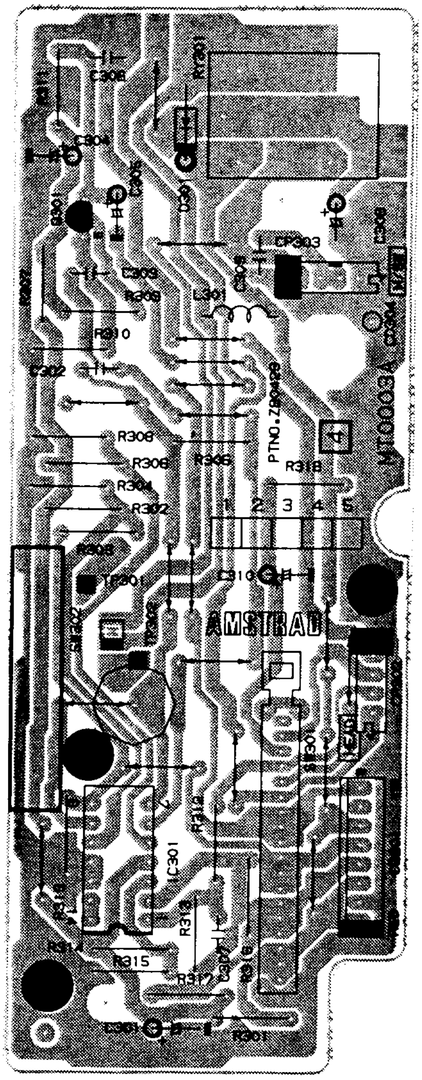
SETTE HOLD/LED

BOTTOM



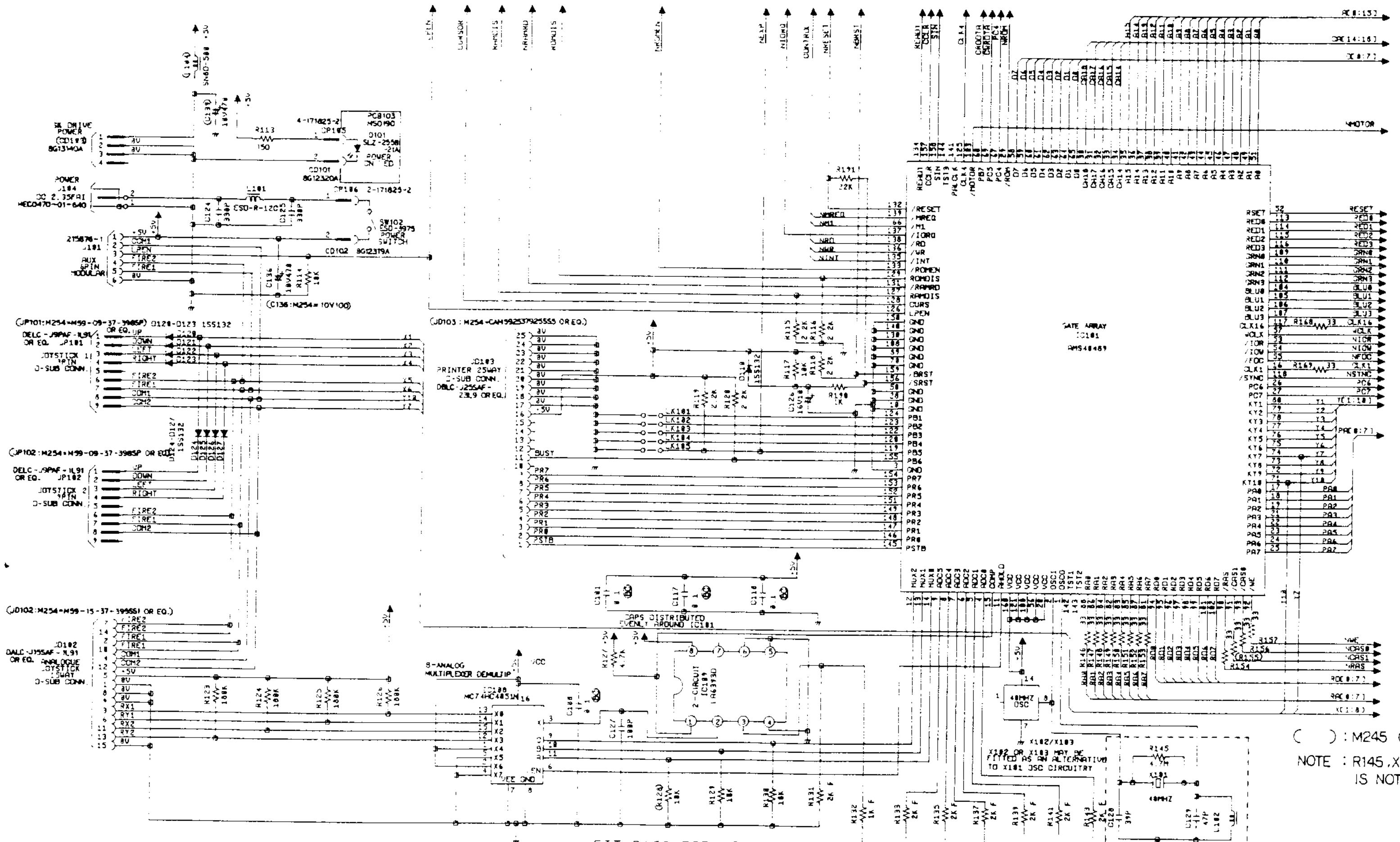
B
A
J102
J04
CP06
C24
2
36
1
35
L01
JD04
C32
R86
R81
R84
Q04
Q05
D1
C36
R82
R83
C34
C30
C5T
R88
R13
C35
CP05 (BLUE)
CD03
CP105
AMSTRAD PLC 1990
2700-019P-2
CE101
MS0189B
IC15
IC13
R12
CD04
C11
C13
C6
25
26
CP106
C32
IC7
C43
C44
R10
Q01
R4
C45
CP07
BLACK
D101
MS0190B

TAPE



R311
C308
R201
C304
C305
D301
R301
C309
R309
L301
CP303
R302
R310
C302
PTNO.Z80408
MT0003A
R308
R306
R305
R304
R302
R318
1
2
3
4
5
R303
TR301
C310
AMSTRAD
IC301
R319
R316
R313
R315
R312
C301
R301

GATE ARRAY / OUTPUT INTERFACE SCHEMATIC DIAGRAM


GATE ARRAY
IC101
JD103
PRINTER 25WAY
D-SUB CONN.
JD102
ANALOGUE JOYSTICK
D-SUB CONN.
JP101
JOYSTICK 1
9PIN
D-SUB CONN.
JP102
JOYSTICK 2
9PIN
D-SUB CONN.
POWER
JP104
DC 2.35FA1
AUX
8PIN
MODULAR
SW102
POWER SWITCH
D101
POWER ON LED
FD DRIVE POWER
8-ANALOG MULTIPLEXER DEMULTIP
IC108
MC74HC4051N
IC109
2-CIRCUIT
40MHZ OSC
X102/X103
X102 OR X103 MAY BE FITTED AS AN ALTERNATIVE TO X101 OSC CIRCUITRY
CAPS DISTRIBUTED EVENLY AROUND IC101
/NMOTOR
RESET
/MREQ
/M1
/IORQ
/RD
/WR
/INT
/ROMEN
ROMDIS
/RAMRD
RAMDIS
CURS
LPEN
PSTB
MA[0:13]
CA[14:16]
D[0:7]
PA[0:7]
RA[0:7]
KC[1:8]
RC[0:7]
KY[1:10]

( ) : M245 ONLY

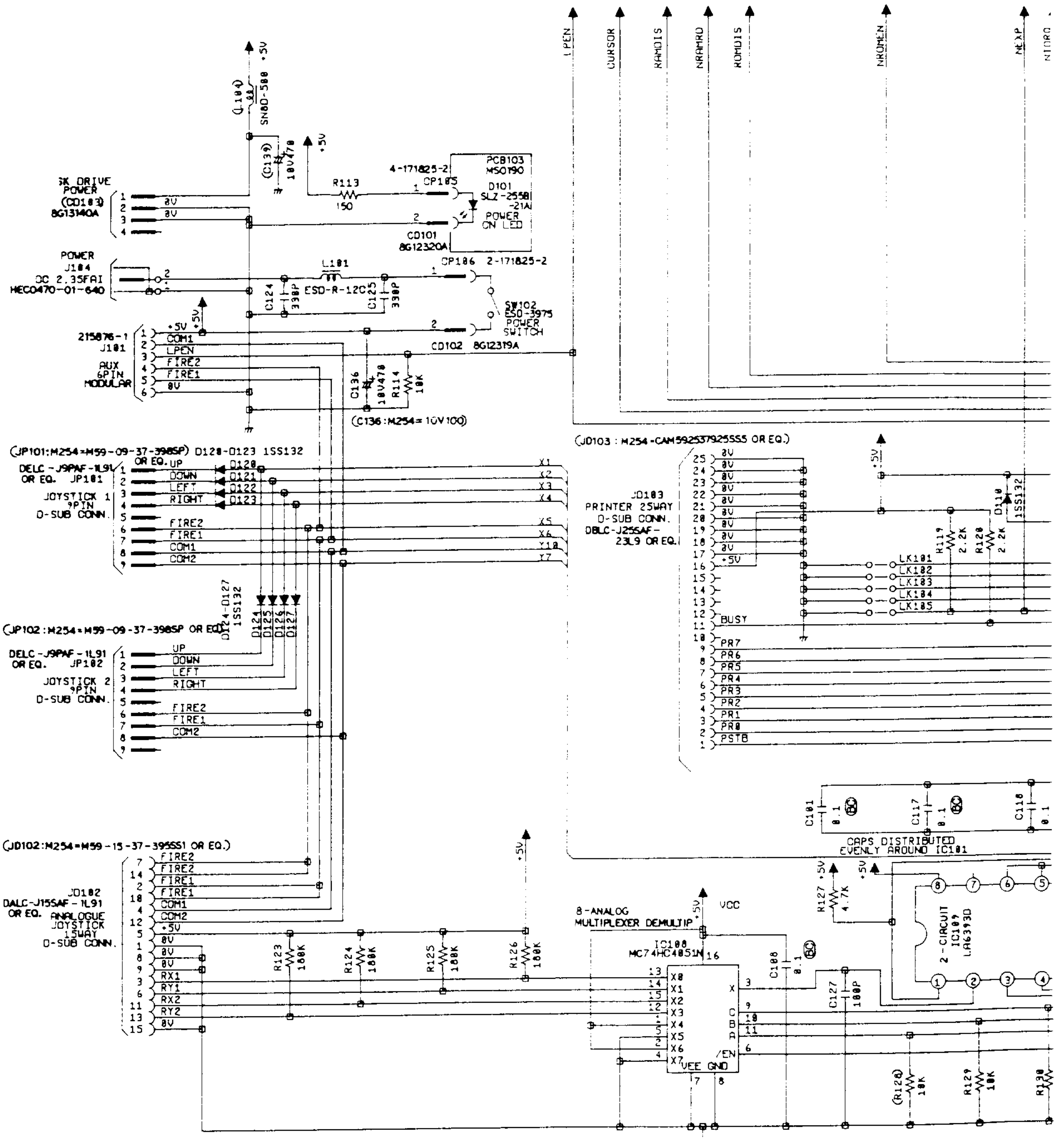
NOTE : R145, X101, C128, C129, L102
IS NOT USE

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS IN THE SCHEMATIC DIAGRAM INDICATES THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

FIT R128 FOR 128K DRAM
FIT R129 FOR DISC VERS
FIT R130 FOR 8-BIT PRINTER

GATE ARRAY / OUTPUT INTER

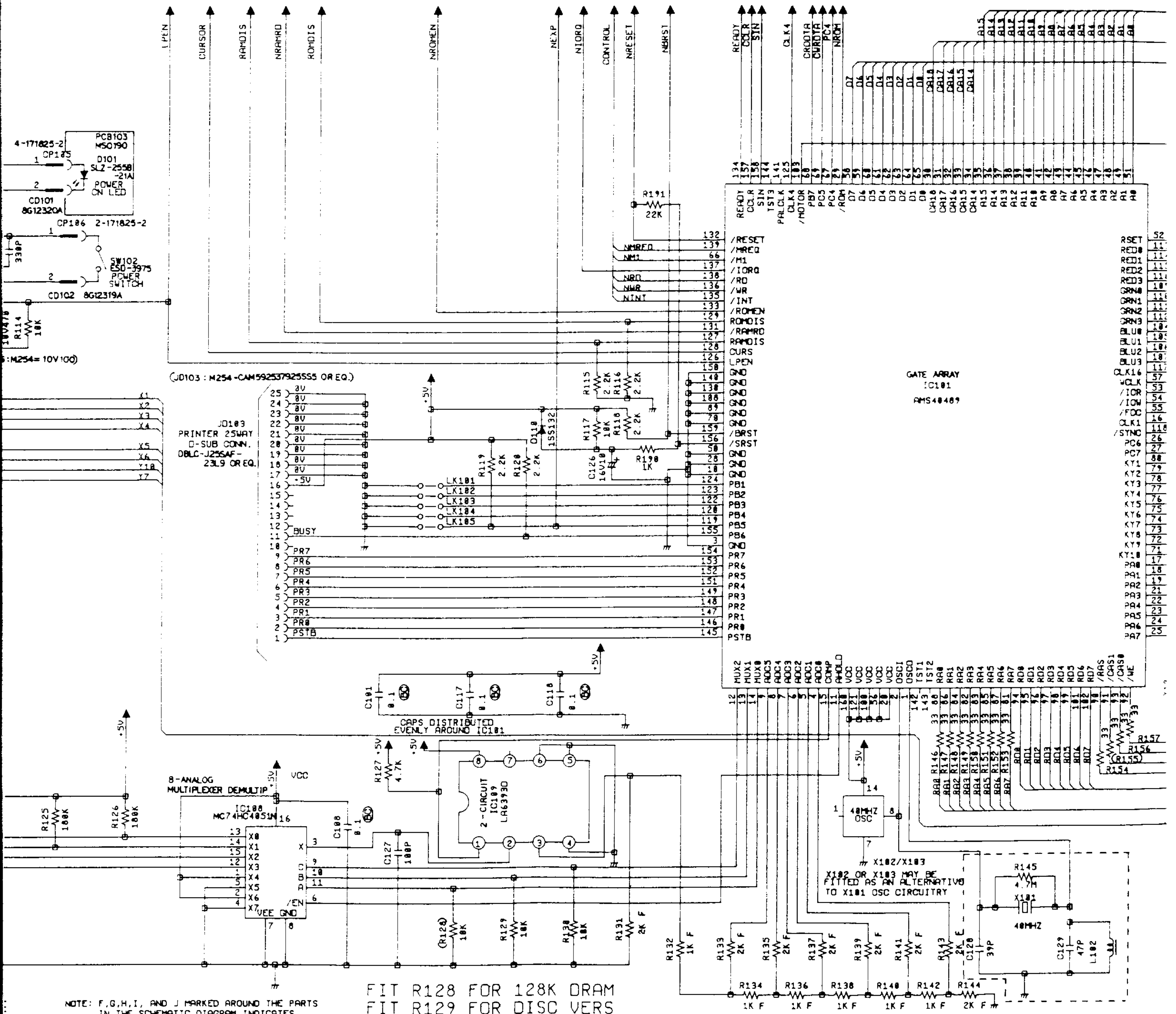

LPEN
CURSOR
RAMDIS
NRAMRD
ROMDIS
NROMEN
NEXP
(L104) SN8D-500
+5V
(C139) 10V470
R113 150
4-171825-2
CP105
PCB103 MS0190
D101 SLZ-255BI -21A
POWER ON LED
CD101 8G12320A
DISK DRIVE POWER (CD103) 8G13140A
0V
POWER J104 DC 2.35FAI HEC0470-01-640
L101 ESD-R-12C
C124 330P
C125 330P
CP106 2-171825-2
SW102 ESD-3975 POWER SWITCH
215876-1 J101 AUX 6PIN MODULAR
+5V
COM1
LPEN
FIRE2
FIRE1
CD102 8G12319A
C136 10V470
R114 10K
(C136:M254=10V100)
(JP101:M254=M59-09-37-398SP) D120-D123 1SS132
DELC-J9PAF-1L91 OR EQ. JP101
JOYSTICK 1 9PIN D-SUB CONN.
UP
DOWN
LEFT
RIGHT
COM2
D120
D121
D122
D123
X1
X2
X3
X4
X5
X6
X10
X7
D124-D127 1SS132
(JP102:M254=M59-09-37-398SP OR EQ.)
DELC-J9PAF-1L91 OR EQ. JP102
JOYSTICK 2 9PIN D-SUB CONN.
(JD102:M254=M59-15-37-395SS1 OR EQ.)
JD102 DALC-J15SAF-1L91 OR EQ. ANALOGUE JOYSTICK 15WAY D-SUB CONN.
RX1
RY1
RX2
RY2
R123 100K
R124 100K
R125 100K
R126 100K
8-ANALOG MULTIPLEXER DEMULTIP
IC108 MC74HC4051N
VCC
X0
X1
X2
X3
X4
X5
X6
X7
VEE GND
/EN
C108 0.1
C127 100P
(JD103 : M254-CAM592537925SS5 OR EQ.)
JD103 PRINTER 25WAY D-SUB CONN. DBLC-J25SAF-23L9 OR EQ.
BUSY
PR7
PR6
PR5
PR4
PR3
PR2
PR1
PR0
PSTB
LK101
LK102
LK103
LK104
LK105
R119 2.2K
R120 2.2K
D110 1SS132
C101 0.1
C117 0.1
C118 0.1
CAPS DISTRIBUTED EVENLY AROUND IC101
R127 4.7K
2-CIRCUIT IC109 LA6393D
(R128) 10K
R129 10K
R130

FIT R128 FOR 128K C
FIT R129 FOR DISC V
FIT R130 FOR 8-BIT

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS IN THE SCHEMATIC DIAGRAM INDICATES THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

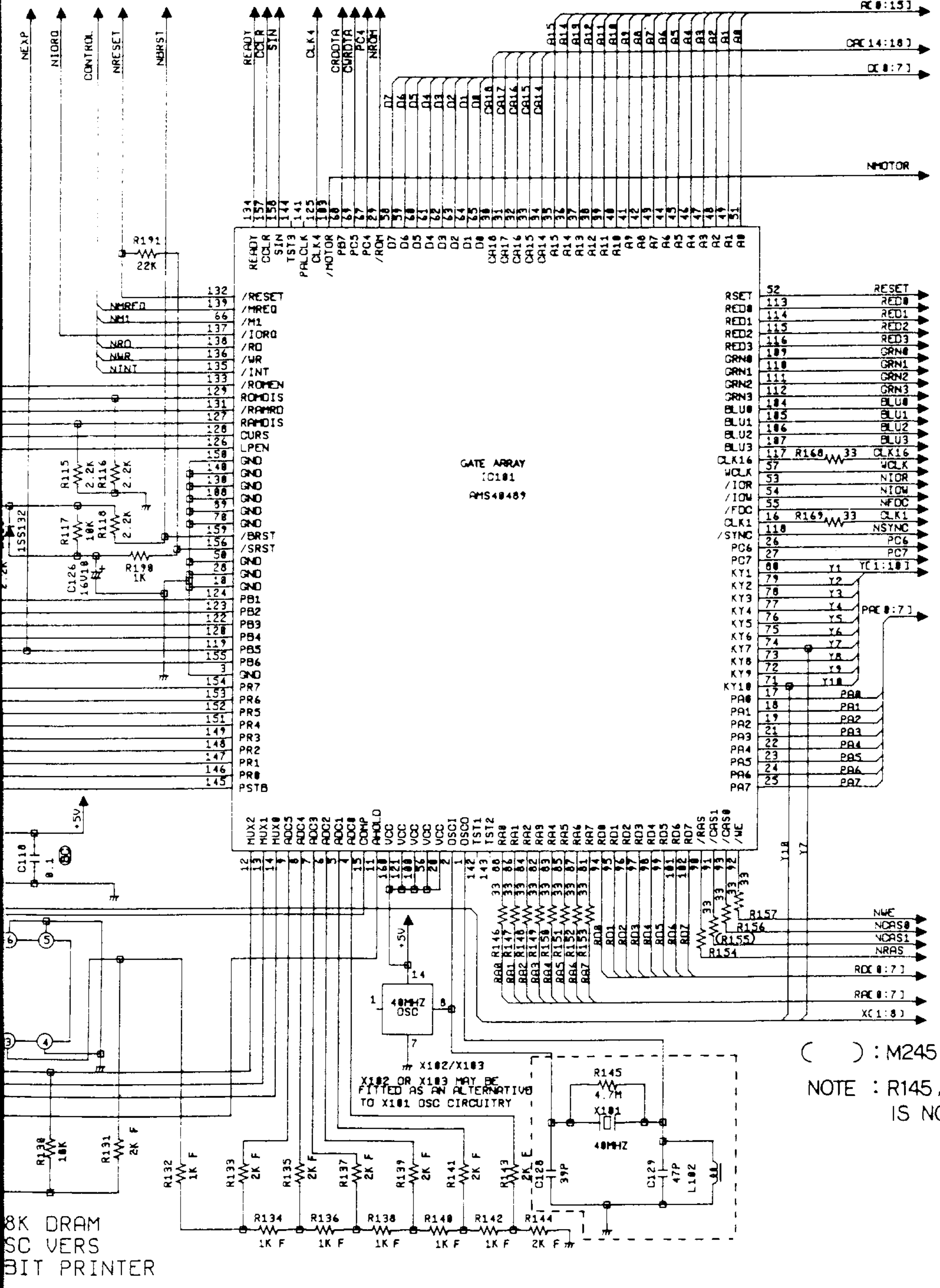
GATE ARRAY / OUTPUT INTERFACE SCHEMATIC DIAGRAM


LPEN
CURSOR
RAMDIS
NRAMRD
ROMDIS
NROMEN
NEXP
NIORQ
CONTROL
NRESET
NBRST
READY
CCLR
STN
CLK4
CRODTA
CWRDTA
PC4
NROM
GATE ARRAY
IC101
AMS40489
PCB103 M50190
D101 SLZ-255B-21A
POWER ON LED
CP105 4-171825-2
CD101 8G12320A
CP106 2-171825-2
SW102 ESD-3975 POWER SWITCH
CD102 8G12319A
R114 10K
(JD103 : M254-CAM592537925SS5 OR EQ.)
JD103 PRINTER 25WAY D-SUB CONN. DBLC-J25SAF-23L9 OR EQ.
LK101
LK102
LK103
LK104
LK105
BUSY
PSTB
R191 22K
R115 2.2K
R116 2.2K
R117 10K
R118 2.2K
R119 2.2K
R120 2.2K
D110 1SS132
C126 16V10
R190 1K
C101 0.1
C117 0.1
C118 0.1
CAPS DISTRIBUTED EVENLY AROUND IC101
8-ANALOG MULTIPLEXER DEMULTIP
IC108 MC74HC4051N
R125 100K
R126 100K
C108 0.1
C127 100P
R127 4.7K
2-CIRCUIT IC109 LA6393D
(R128) 10K
R129 10K
R130 10K
R131 2K F
R132 1K F
R133 2K F
R135 2K F
R137 2K F
R139 2K F
R141 2K F
R143 2K F
R134 1K F
R136 1K F
R138 1K F
R140 1K F
R142 1K F
R144 2K F
40MHZ OSC
X102/X103
X102 OR X103 MAY BE FITTED AS AN ALTERNATIVE TO X101 OSC CIRCUITRY
R145 4.7M
X101 40MHZ
C128 39P
C129 47P
L102
R146
R154
R155
R156
R157

NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS
IN THE SCHEMATIC DIAGRAM INDICATES
THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

FIT R128 FOR 128K DRAM
FIT R129 FOR DISC VERS
FIT R130 FOR 8-BIT PRINTER

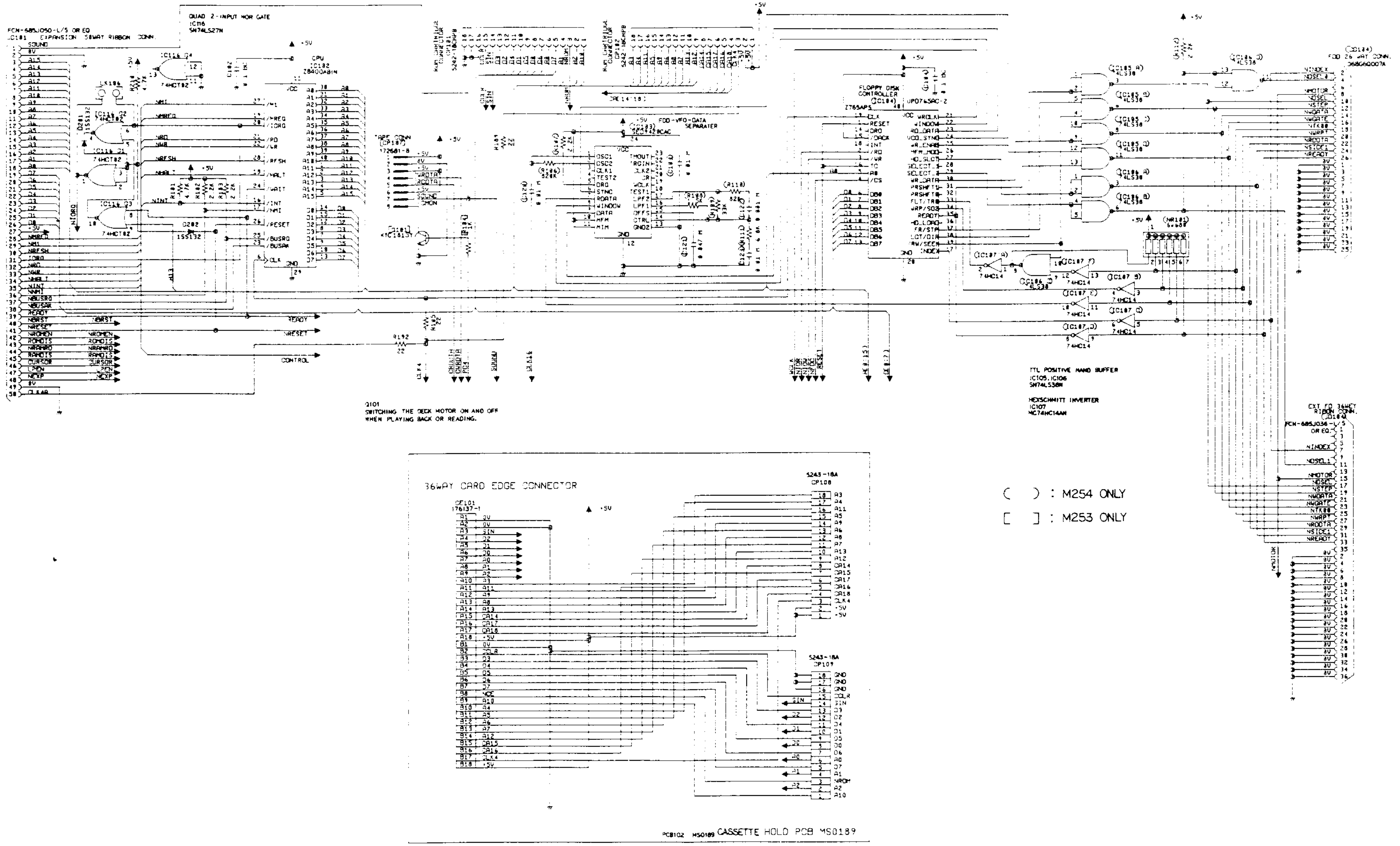
ITERFACE SCHEMATIC DIAGRAM


NEXP
NIORQ
CONTROL
NRESET
NBRST
READY
CCLR
SIN
CLK4
CRDDTA
CWRDTA
PC4
NROM
RC0:15]
CRC14:18]
DC0:7]
NMOTOR
R191
22K
/RESET
/MREQ
/M1
/IORQ
/RD
/WR
/INT
/ROMEN
ROMDIS
/RAMRD
RAMDIS
CURS
LPEN
GND
/BRST
/SRST
PB1
PB2
PB3
PB4
PB5
PB6
PR7
PR6
PR5
PR4
PR3
PR2
PR1
PR0
PSTB
NMREQ
NM1
NRD
NWR
NINT
R115
2.2K
R116
2.2K
R117
10K
R118
2.2K
1SS132
C126
16V10
R198
1K
GATE ARRAY
IC101
AMS40489
RSET
RED0
RED1
RED2
RED3
GRN0
GRN1
GRN2
GRN3
BLU0
BLU1
BLU2
BLU3
CLK16
WCLK
/IOR
/IOW
/FDC
CLK1
/SYNC
PC6
PC7
KY1
KY2
KY3
KY4
KY5
KY6
KY7
KY8
KY9
KY10
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
RESET
R168
33
R169
33
NIOR
NIOW
NFDC
NSYNC
Y[1:10]
PA[0:7]
MUX2
MUX1
MUX0
ADC5
ADC4
ADC3
ADC2
ADC1
ADC0
COMP
AHOLD
VCC
OSCI
OSCO
TST1
TST2
RA0
RA7
RD0
RD7
/RAS
/CAS1
/CAS0
/WE
R146
R147
R148
R149
R150
R151
R152
R153
R154
(R155)
R156
R157
NWE
NCAS0
NCAS1
NRAS
RD[0:7]
RA[0:7]
X[1:8]
Y10
Y7
+5V
C110
0.1
40MHZ
OSC
X102/X103
X102 OR X103 MAY BE FITTED AS AN ALTERNATIVE TO X101 OSC CIRCUITRY
R145
4.7M
X101
40MHZ
C128
39P
C129
47P
L102
R130
10K
R131
2K F
R132
1K F
R133
2K F
R135
2K F
R137
2K F
R139
2K F
R141
2K F
R143
2K F
R134
1K F
R136
1K F
R138
1K F
R140
1K F
R142
1K F
R144
2K F
8K DRAM
SC VERS
BIT PRINTER

( ) : M245 ONLY

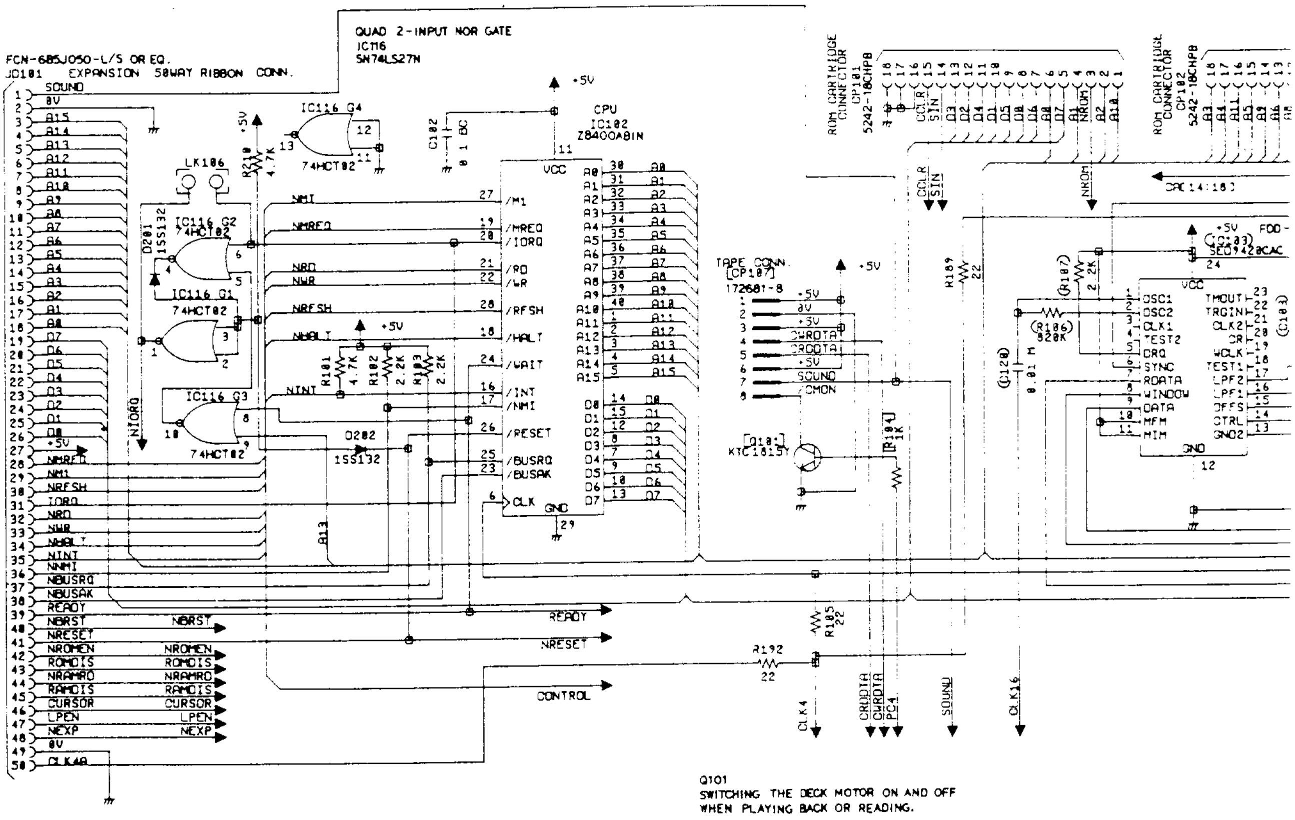
NOTE : R145,X101,C128,C129,L102
IS NOT USE

CPU / CONNECTION INTERFACE SCHEMATIC DIAGRAM


FCN-685J050-L/S OR EQ
IC101 EXPANSION 50WAY RIBBON CONN
QUAD 2-INPUT NOR GATE
IC116
SN74LS27N
CPU
IC102
Z8400ABIN
74HCT02
1SS132
TAPE CONN
CP107
FDD-VFO-DATA SEPARATER
FLOPPY DISK CONTROLLER
IC104
UPD765AC-2
Z765APS
FDD 26 WAY CONN.
EXT FD 36WAY RIBBON CONN.
FCN-685J036-L/S OR EQ
Q101
SWITCHING THE DECK MOTOR ON AND OFF WHEN PLAYING BACK OR READING.
TTL POSITIVE NAND BUFFER
IC105, IC106
SN74LS38N
HEXSCHMITT INVERTER
IC107
MC74HC14AN
( ) : M254 ONLY
[ ] : M253 ONLY
36WAY CARD EDGE CONNECTOR
CE101
176137-1
5243-18A
CP108
CP109
PCB102 MS0189 CASSETTE HOLD PCB MS0189
READY
RESET
CONTROL
+5V

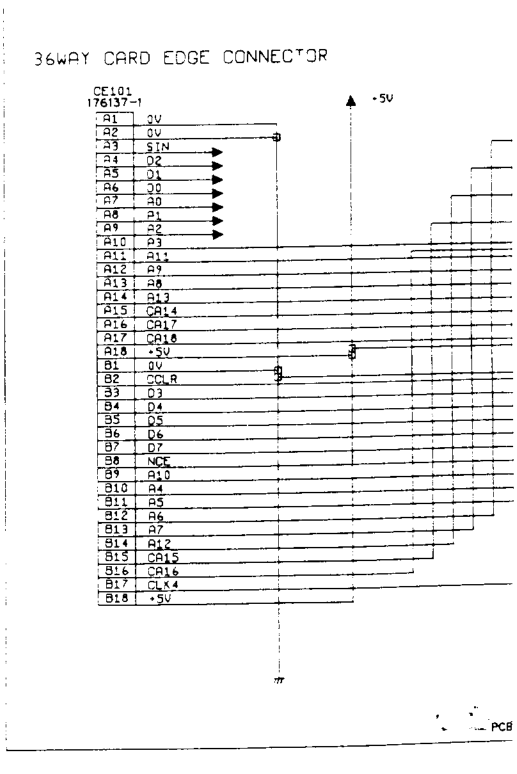
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CPU / CONNECTION INTE



FCN-685J050-L/S OR EQ.
JD101 EXPANSION 50WAY RIBBON CONN.
QUAD 2-INPUT NOR GATE
IC116
SN74LS27N
CPU
IC102
Z8400AB1N
+5V
LK106
D201 1SS132
D202 1SS132
IC116 G1
IC116 G2
IC116 G3
IC116 G4
74HCT02
R110 4.7K
R101 4.7K
R102 2.2K
R103 2.2K
C102 0.1 BC
SOUND
0V
A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
D7
D6
D5
D4
D3
D2
D1
D0
+5V
NMREQ
NM1
NRFSH
IORQ
NRD
NWR
NHALT
NINT
NNMI
NBUSRQ
NBUSAK
READY
NBRST
NRESET
NROMEN
ROMDIS
NRAMRD
RAMDIS
CURSOR
LPEN
NEXP
0V
CLK40
NIORQ
/M1
/MREQ
/IORQ
/RD
/WR
/RFSH
/HALT
/WAIT
/INT
/NMI
/RESET
/BUSRQ
/BUSAK
CLK
VCC
GND
READY
NRESET
CONTROL
ROM CARTRIDGE CONNECTOR
CP101
5242-18CHP0
CP102
CCLR
SIN
NROM
CA(14:18)
TAPE CONN.
[CP107]
172681-8
0V
CWROTA
CRDOTA
SOUND
CMON
[Q101]
KTC1815Y
[R108] 1K
R109 22
R105 22
R192 22
[R107] 2.2K
[R106] 820K
(C120) 0.01 M
(C103)
SED9420CAC
FDD
OSC1
OSC2
CLK1
TEST2
DRQ
SYNC
RDATA
WINDOW
DATA
MFM
MIM
THOUT
TRGIN
CLK2
CR
WCLK
TEST1
LPF2
LPF1
OFFS
CTRL
GND2
CLK4
CRDDTA
CWRDTA
PC4
SOUND
CLK16

Q101
SWITCHING THE DECK MOTOR ON AND OFF
WHEN PLAYING BACK OR READING.



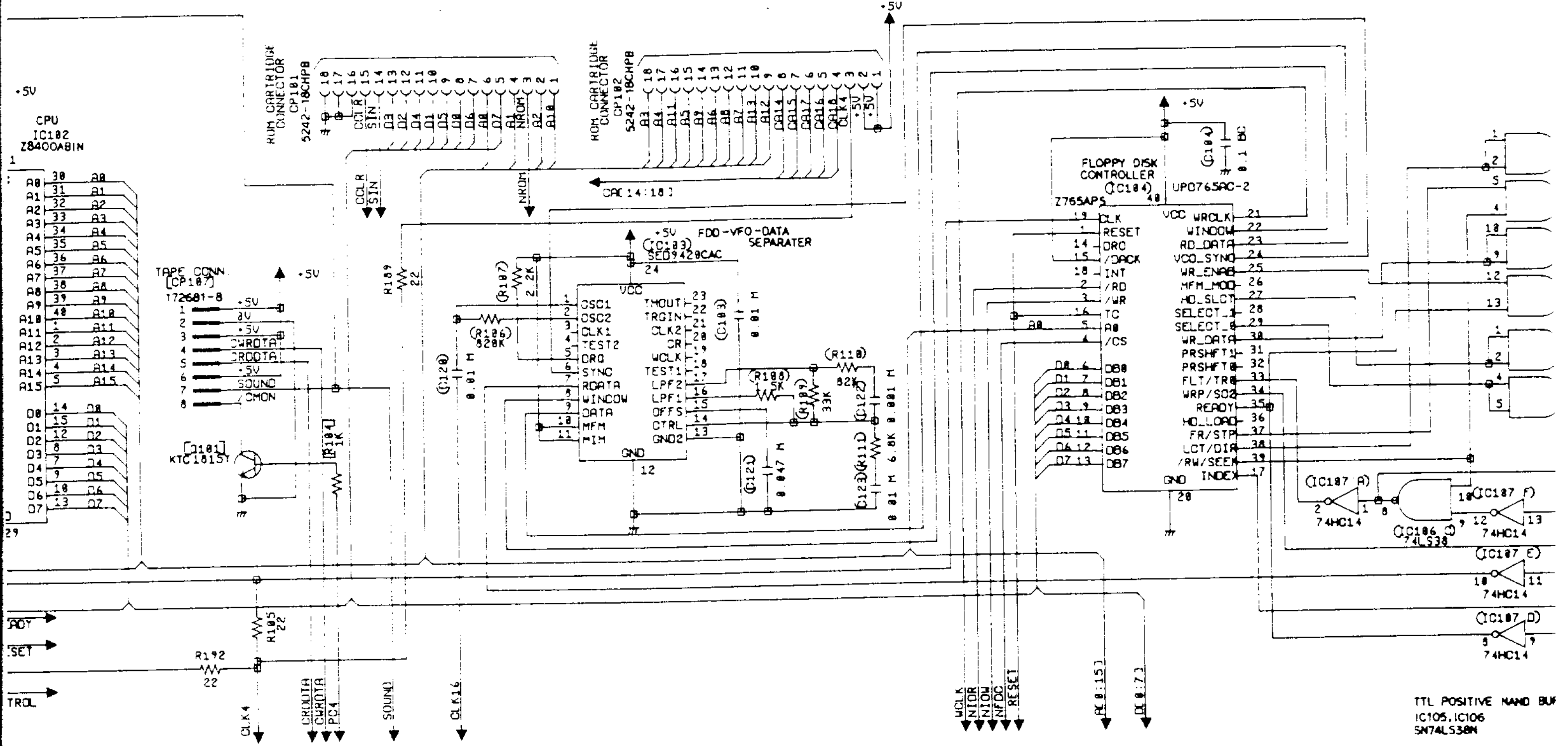
36WAY CARD EDGE CONNECTOR

CE101
176137-1

A1	0V
A2	0V
A3	SIN
A4	D2
A5	D1
A6	D0
A7	A0
A8	A1
A9	A2
A10	A3
A11	A11
A12	A9
A13	A8
A14	A13
A15	CA14
A16	CA17
A17	CA18
A18	+5V
B1	0V
B2	CCLR
B3	D3
B4	D4
B5	D5
B6	D6
B7	D7
B8	NCE
B9	A10
B10	A4
B11	A5
B12	A6
B13	A7
B14	A12
B15	CA15
B16	CA16
B17	CLK4
B18	+5V

NOTE: THIS SCHEMATIC DIAGRAM IS TH
OF PRINTING AND SUBJECT TO C

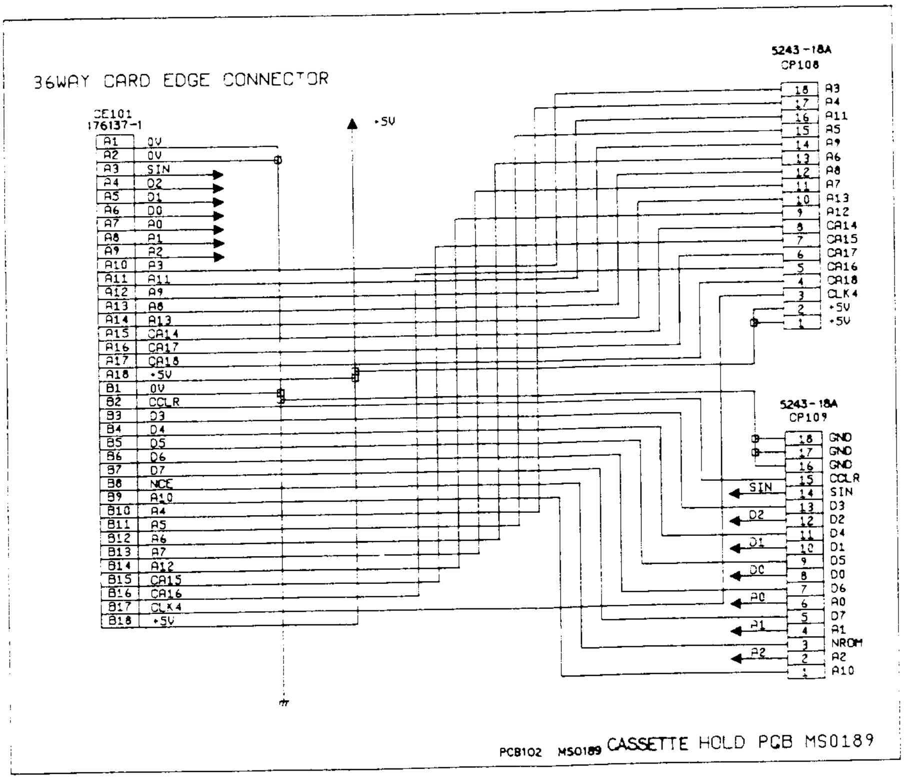
CPU / CONNECTION INTERFACE SCHEMATIC DIAGRAM


CPU
IC102
Z8400AB1N
+5V
ROM CARTRIDGE CONNECTOR
CP101
5242-18CHPB
ROM CARTRIDGE CONNECTOR
CP102
5242-18CHPB
CA[14:18]
TAPE CONN
[CP107]
172681-8
+5V
0V
CWRDTA
CRDDTA
SOUND
CMON
[Q101]
KTC1815Y
R104
1K
R189
22
FDD-VFO-DATA SEPARATER
(IC183)
SED9420CAC
(R107)
2.2K
(R106)
820K
(C120)
0.01 M
(C103)
0.01 M
(R108)
5K
(R109)
33K
(R110)
82K
(R111)
6.8K
(C121)
0.047 M
(C122)
0.001 M
(C123)
0.01 M
FLOPPY DISK CONTROLLER
(IC184)
Z765APS
UPD765AC-2
(C104)
0.1 BC
(IC187 A)
(IC187 F)
(IC187 E)
(IC187 D)
74HC14
(IC186 C)
74LS38
RDY
RESET
TROL
R192
22
R105
22
CLK4
CRDDTA
CWRDTA
PC4
SOUND
CLK16
WCLK
NIOR
NIOW
NFDC
RESET
A[0:15]
D[0:7]

Q101
SWITCHING THE DECK MOTOR ON AND OFF
WHEN PLAYING BACK OR READING.

TTL POSITIVE NAND BU
IC105, IC106
SN74LS38N

HEXSCHMITT INVERTER
IC107
MC74HC14AN

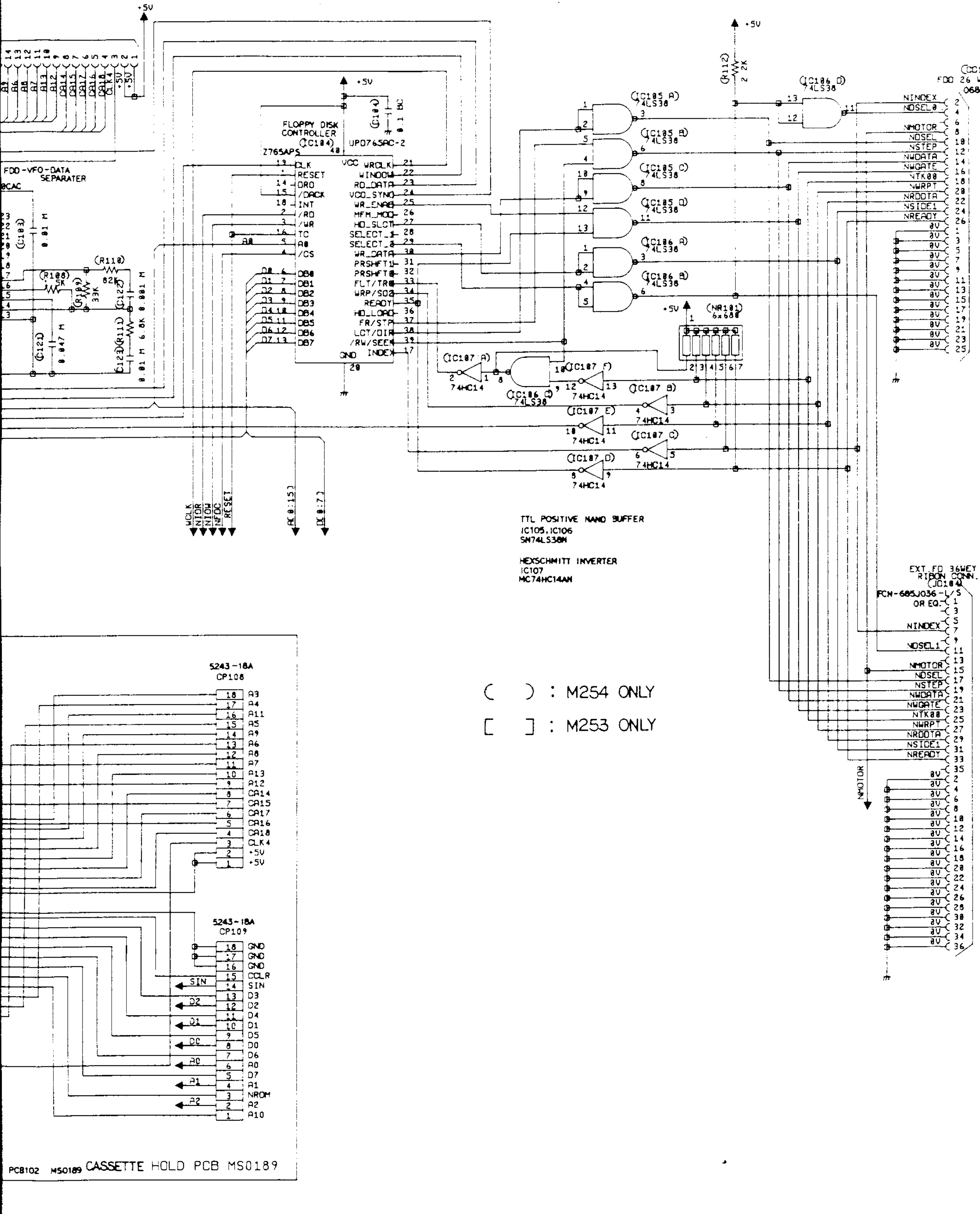

36WAY CARD EDGE CONNECTOR
CE101
176137-1
+5V
5243-18A
CP108
5243-18A
CP109
PCB102 MS0189
CASSETTE HOLD PCB MS0189

( ) : M254 (

[ ] : M253 (

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

TERFACE SCHEMATIC DIAGRAM



+5V
FLOPPY DISK CONTROLLER
(IC104)
Z765APS
UPD765AC-2
CLK
RESET
DRQ
/DACK
INT
/RD
/WR
TC
A0
/CS
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
VCC
WRCLK
WINDOW
RD_DATA
VCO_SYNC
WR_ENAB
MFM_MOD
HD_SLCT
SELECT_1
SELECT_0
WR_DATA
PRSHFT1
PRSHFT0
FLT/TR0
WRP/SO2
READY
HD_LOAD
FR/STP
LCT/DIR
/RW/SEEK
INDEX
GND
FDD-VFO-DATA SEPARATER
(C103)
(R108)
(R109)
(R110)
(R111)
(C121)
(C122)
(C123)
(C104)
(R112)
2.2K
(IC105 A) 74LS38
(IC105 B) 74LS38
(IC105 C) 74LS38
(IC105 D) 74LS38
(IC106 A) 74LS38
(IC106 B) 74LS38
(IC106 C) 74LS38
(IC106 D) 74LS38
(IC107 A) 74HC14
(IC107 B) 74HC14
(IC107 C) 74HC14
(IC107 D) 74HC14
(IC107 E) 74HC14
(IC107 F) 74HC14
(NR101) 6x680
(CD104)
FDD 26 WAY CONN.
0686G6Q007A
NINDEX
NDSEL0
NMOTOR
NDSEL
NSTEP
NWDATA
NWGATE
NTK00
NWRPT
NRDDTA
NSIDE1
NREADY
0V
EXT FD 36WEY RIBON CONN.
(JD104)
FCN-685J036-L/S OR EQ.
NINDEX
NDSEL1
NMOTOR
WCLK
NIOR
NIOW
NFDC
RESET
A[0:15]
D[0:7]
5243-18A
CP108
A3
A4
A11
A5
A9
A6
A8
A7
A13
A12
CA14
CA15
CA17
CA16
CA18
CLK4
+5V
+5V
5243-18A
CP109
GND
GND
GND
CCLR
SIN
D3
D2
D4
D1
D5
D0
D6
A0
D7
A1
NROM
A2
A10
SIN
D2
D1
D0
A0
A1
A2
PCB102 MS0189 CASSETTE HOLD PCB MS0189

TTL POSITIVE NAND BUFFER
IC105, IC106
SN74LS38N

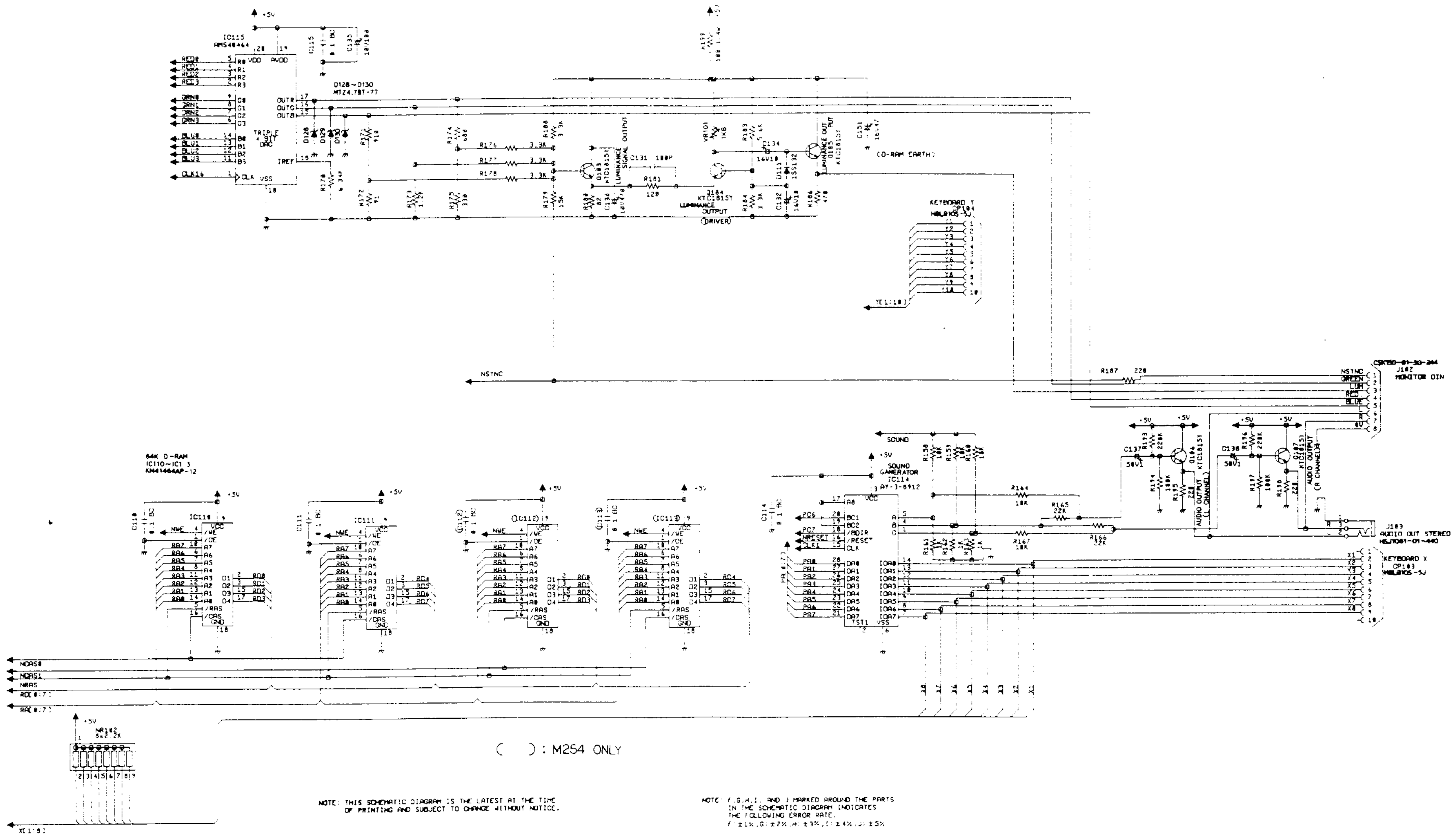
HEXSCHMITT INVERTER
IC107
MC74HC14AN

( ) : M254 ONLY

[ ] : M253 ONLY

S THE LATEST AT THE TIME
TO CHANGE WITHOUT NOTICE.

VIDEO CONVERSION / MEMORY SCHEMATIC DIAGRAM

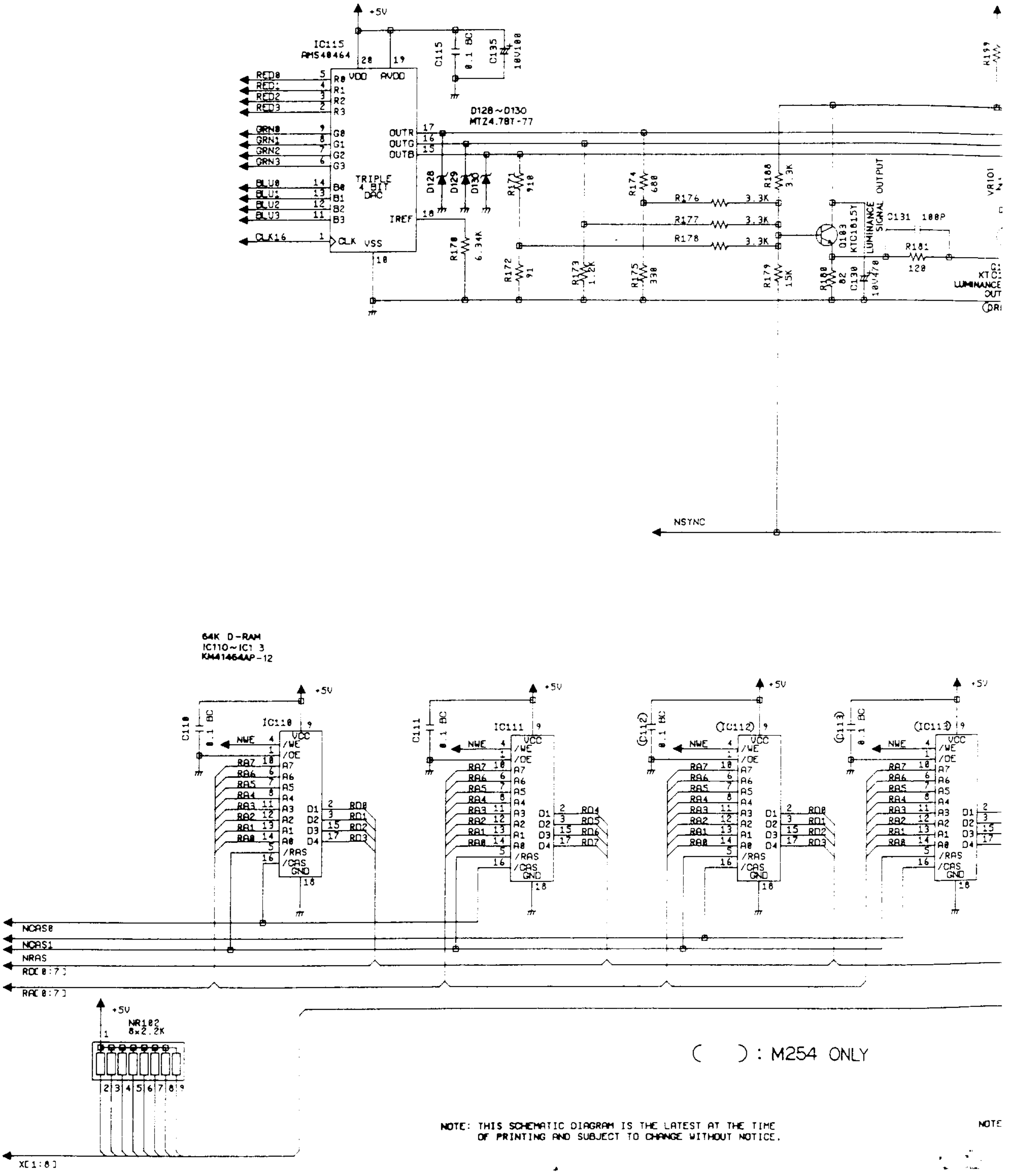

IC115
RMS40464
TRIPLE 4 BIT DAC
RED0
RED1
RED2
RED3
GRN0
GRN1
GRN2
GRN3
BLU0
BLU1
BLU2
BLU3
CLK16
VDD
AVDD
OUTR
OUTG
OUTB
IREF
CLK
VSS
+5V
C115
0.1 BC
C135
10V100
D128~D130
MTZ4.7BT-77
R170
R171
R172
R173
R174
R175
R176 3.3K
R177 3.3K
R178 3.3K
R179 15K
R180
R181 120
Q103
KTC1815Y
LUMINANCE SIGNAL OUTPUT
C131 100P
Q104
KTC1815Y
LUMINANCE OUTPUT (DRIVER)
VR101 1K0
R183
R184
C134
D111 1SS132
C132
Q105
KTC1815Y
LUMINANCE OUT PUT
R186
C151
(D-RAM EARTH)
R131
KEYBOARD Y
CP104
HBL010S-5J
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y[1:10]
NSYNC
R187 220
CSKE0-01-30-244
J102
MONITOR DIN
NSYNC
GREEN
LUM
RED
BLUE
R
L
0V
SOUND
+5V
SOUND GANERATOR
IC114
AY-3-8912
VCC
A8
BC1
BC2
/BDIR
/RESET
CLK
DA0
DA1
DA2
DA3
DA4
DA5
DA6
DA7
IOA0
IOA1
IOA2
IOA3
IOA4
IOA5
IOA6
IOA7
TST1
VSS
PC6
PC7
NRESET
CLK1
PA[0:7]
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
C114
0.1 BC
R158 10K
R159 10K
R160 10K
R161 1K
R162 1K
R163 1K
R164 10K
R165 22K
R166 22K
R167 10K
C137 50V1
R193 220K
R194 100K
R195 220
Q106
KTC1815Y
AUDIO OUTPUT (L CHANNEL)
C138 50V1
R196 220K
R197 100K
R198 220
Q107
KTC1815Y
AUDIO OUTPUT (R CHANNEL)
J103
AUDIO OUT STEREO
HSJ1081-01-440
KEYBOARD X
CP103
HBL010S-5J
X1
X2
X3
X4
X5
X6
X7
X8
64K D-RAM
IC110~IC113
KM41464AP-12
IC110
IC111
(IC112)
(IC113)
C110
C111
(C112)
(C113)
NWE
RA0
RA1
RA2
RA3
RA4
RA5
RA6
RA7
/WE
/OE
A0
A1
A2
A3
A4
A5
A6
A7
/RAS
/CAS
GND
D1
D2
D3
D4
RD0
RD1
RD2
RD3
RD4
RD5
RD6
RD7
NCAS0
NCAS1
NRAS
RD[0:7]
RA[0:7]
NR102
8×2.2K
X[1:8]

( ): M254 ONLY

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS IN THE SCHEMATIC DIAGRAM INDICATES THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

VIDEO CONVERSION / ME

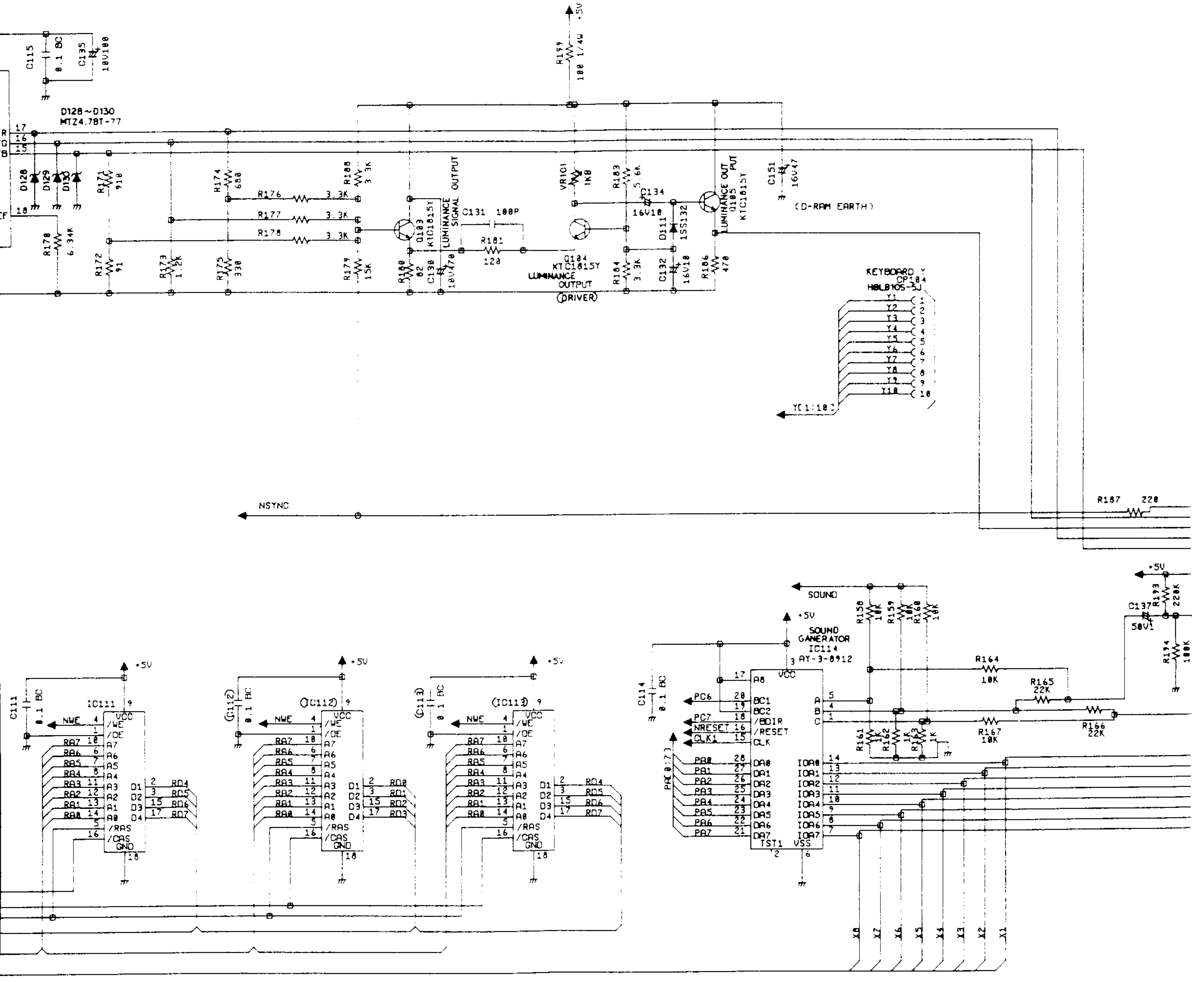


+5V
IC115
AMS40464
RED0
RED1
RED2
RED3
GRN0
GRN1
GRN2
GRN3
BLU0
BLU1
BLU2
BLU3
CLK16
VDD
AVDD
OUTR
OUTG
OUTB
TRIPLE
4 BIT
DAC
IREF
CLK
VSS
C115
0.1 BC
C135
10V100
D128~D130
MTZ4.7BT-77
D128
D129
D130
R170
6.34K
R171
910
R172
91
R173
1.2K
R174
680
R175
330
R176
3.3K
R177
3.3K
R178
3.3K
R179
15K
R180
82
R188
3.3K
Q103
KTC1815Y
LUMINANCE SIGNAL OUTPUT
C130
10V470
C131
100P
R181
120
R199
VR101
LUMINANCE OUT
NSYNC
64K D-RAM
IC110~IC113
KM41464AP-12
C110
C111
(C112)
(C113)
IC110
IC111
(IC112)
(IC113)
NWE
/WE
/OE
VCC
GND
RA7
RA6
RA5
RA4
RA3
RA2
RA1
RA0
A7
A6
A5
A4
A3
A2
A1
A0
/RAS
/CAS
D1
D2
D3
D4
RD0
RD1
RD2
RD3
RD4
RD5
RD6
RD7
NCAS0
NCAS1
NRAS
RD[0:7]
RA[0:7]
NR102
8x2.2K
X[1:8]
( ) : M254 ONLY

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE

VIDEO CONVERSION / MEMORY SCHEMATIC DIAGRAM

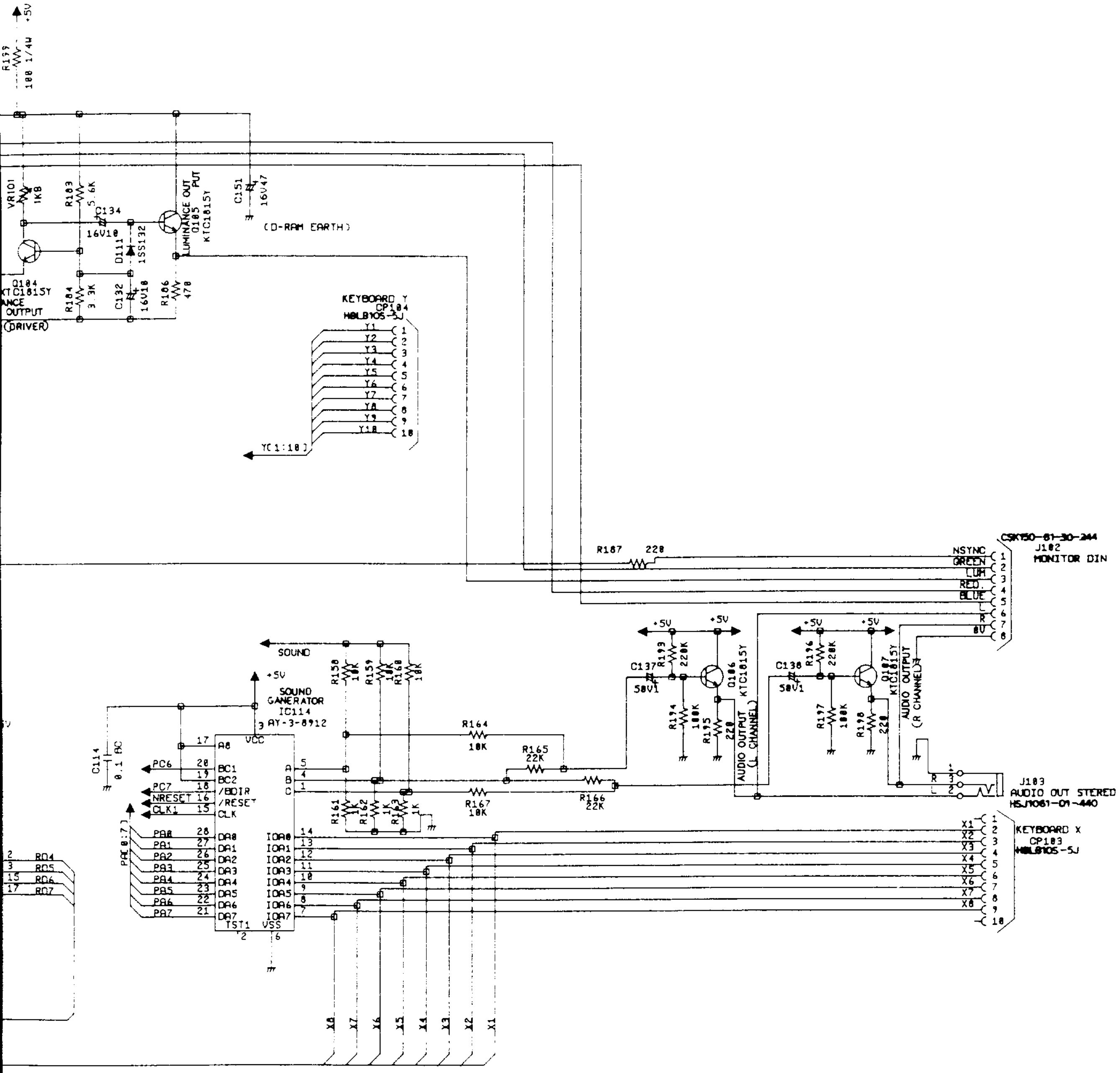

+5V
R159 100 1/4W
C115 0.1 BC
C135 10V100
D128~D130
MTZ4.7BT-77
R
G
B
17
16
15
18
D128
D129
D130
R171 910
R170 6.34K
R172 91
R173 1.2K
R174 680
R175 330
R176 3.3K
R177 3.3K
R178 3.3K
R180 3.3K
R179 15K
R182 82
Q103 KTC1815Y
C130 10V470
LUMINANCE SIGNAL OUTPUT
C131 100P
R181 120
Q104 KTC1815Y
LUMINANCE OUTPUT (DRIVER)
VR101 1K0
R183 5.6K
C134 16V10
D111 1SS132
R184 3.3K
C132 16V10
R186 470
Q105 KTC1815Y
LUMINANCE OUT PUT
C151 16V47
(D-RAM EARTH)
KEYBOARD
CP104
H0LB10S-3J
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y[1:10]
NSYNC
R187 220
SOUND
R158 10K
R159 10K
R160 10K
+5V
SOUND GANERATOR
IC114
AY-3-8912
C114 0.1 BC
PC6
PC7
NRESET
CLK1
PA[0:7]
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
A8
BC1
BC2
/BDIR
/RESET
CLK
DA0
DA1
DA2
DA3
DA4
DA5
DA6
DA7
TST1
VSS
VCC
IOA0
IOA1
IOA2
IOA3
IOA4
IOA5
IOA6
IOA7
R161 1K
R162 1K
R163 1K
R164 10K
R165 22K
R166 22K
R167 10K
C137 50V1
R193 220K
R194 100K
+5V
C111 0.1 BC
IC111
(C112) 0.1 BC
(IC112)
(C113) 0.1 BC
(IC113)
NWE
/WE
/OE
RA7
RA6
RA5
RA4
RA3
RA2
RA1
RA0
A7
A6
A5
A4
A3
A2
A1
A0
/RAS
/CAS
GND
VCC
D1
D2
D3
D4
RD4
RD5
RD6
RD7
RD0
RD1
RD2
RD3
X0
X7
X6
X5
X4
X3
X2
X1

( ): M254 ONLY

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS
IN THE SCHEMATIC DIAGRAM INDICATES
THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

EMORY SCHEMATIC DIAGRAM


R179
100 1/4W
+5V
VR101
1K0
R103
5.6K
C134
16V10
Q105
KTC1815Y
LUMINANCE OUT PUT
C151
16V47
(D-RAM EARTH)
D111
1SS132
Q104
KTC1815Y
OUTPUT
(DRIVER)
R104
3.3K
C132
16V10
R106
470
KEYBOARD Y
CP104
HBLB105-5J
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y[1:10]
R187
220
CSK150-01-30-244
J102
MONITOR DIN
NSYNC
GREEN
LUM
RED.
BLUE
L
R
0V
+5V
C137
50V1
R193
220K
R194
100K
R195
220
Q106
KTC1815Y
AUDIO OUTPUT
(L CHANNEL)
C138
50V1
R196
220K
R197
100K
R198
220
Q107
KTC1815Y
AUDIO OUTPUT
(R CHANNEL)
SOUND
R158
10K
R159
10K
R160
10K
SOUND
GANERATOR
IC114
AY-3-8912
VCC
C114
0.1 BC
R164
10K
R165
22K
R166
22K
R167
10K
R161
1K
R162
1K
R163
1K
J103
AUDIO OUT STEREO
HSJ1061-01-440
A8
BC1
BC2
/BDIR
/RESET
CLK
PC6
PC7
NRESET
CLK1
PA[0:7]
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
DA0
DA1
DA2
DA3
DA4
DA5
DA6
DA7
TST1
VSS
IOA0
IOA1
IOA2
IOA3
IOA4
IOA5
IOA6
IOA7
A
B
C
RD4
RD5
RD6
RD7
KEYBOARD X
CP103
HBLB105-5J
X1
X2
X3
X4
X5
X6
X7
X8

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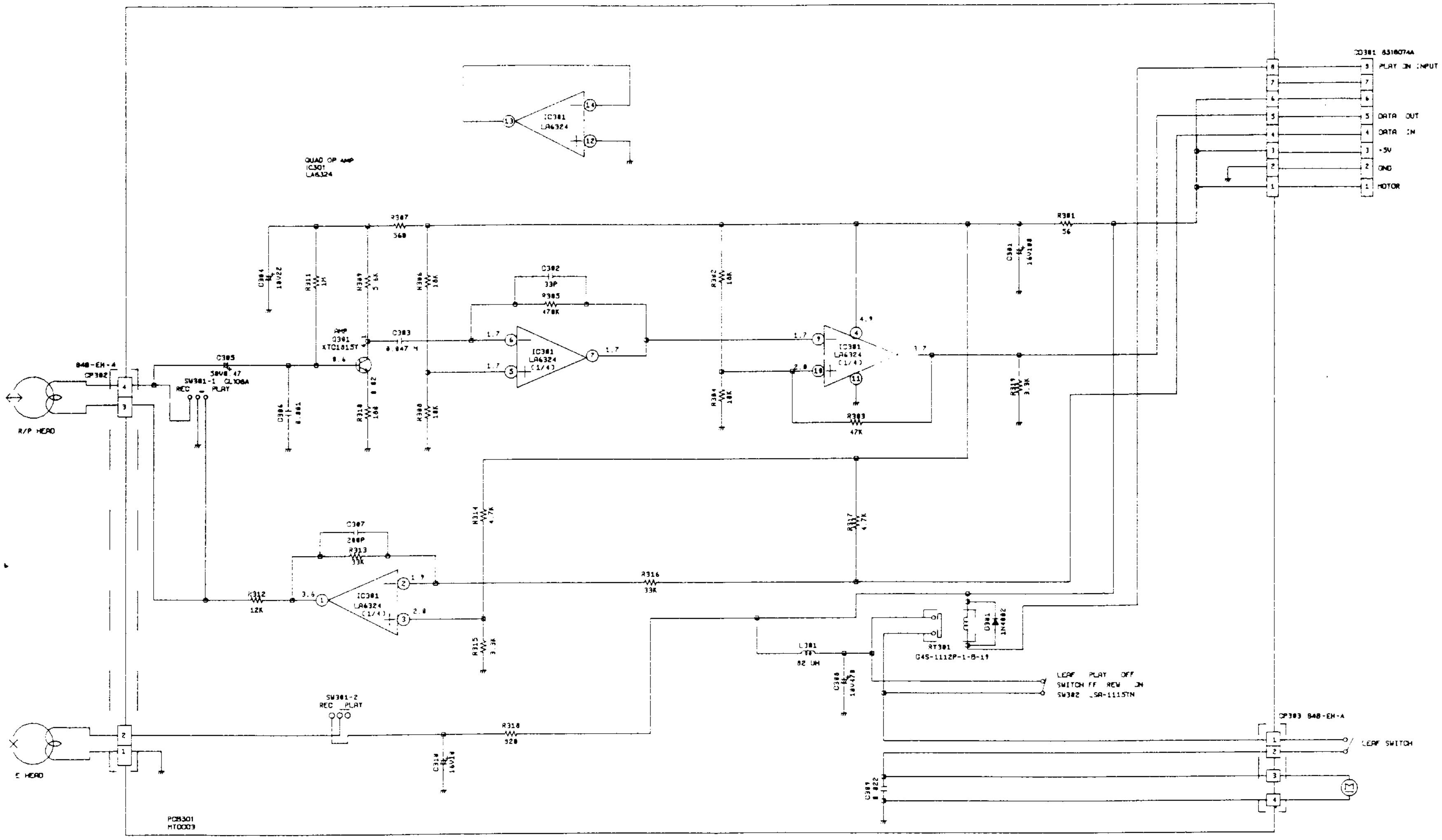
IN THE SCHEMATIC DIAGRAM INDICATES
THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

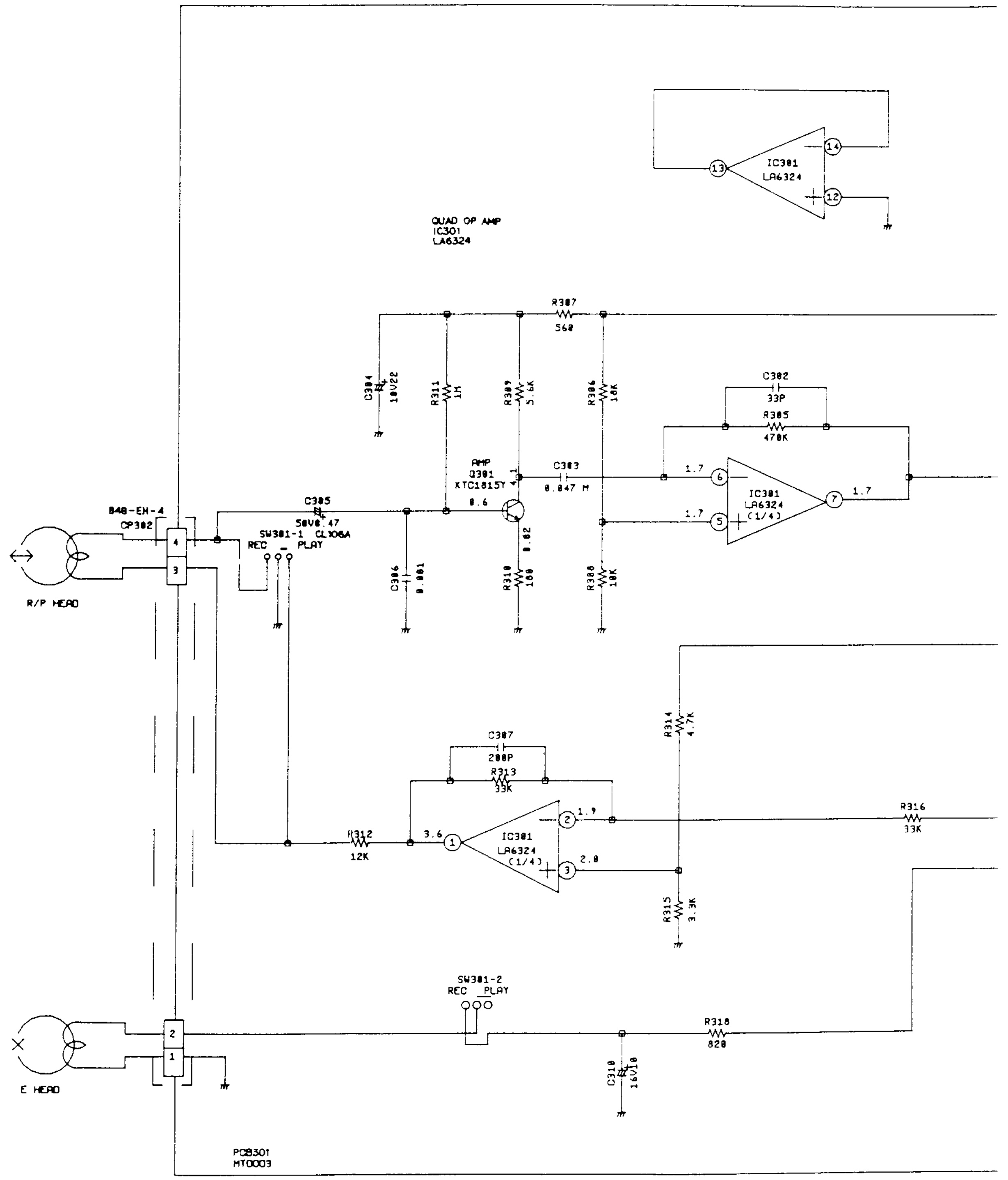
SCHEMATIC DIAGRAM
CASSETTE INTERFACE



QUAD OP AMP
IC301
LA6324
IC301
LA6324
IC301
LA6324
(1/4)
IC301
LA6324
(1/4)
IC301
LA6324
(1/4)
R307
560
C304
10V22
R311
1M
R309
5.6K
R306
10K
R308
10K
R310
100
C302
33P
R305
470K
AMP
Q301
XTC1815Y
0.6
0.02
C303
0.047 M
C305
50V0.47
C306
0.001
SW301-1 CL106A
REC PLAY
848-EH-4
CP302
R/P HEAD
E HEAD
1.7
1.7
1.7
1.7
4.9
2.0
1.9
2.8
3.6
R302
10K
R304
10K
R303
47K
R301
56
C301
16V100
R319
3.3K
R314
4.7K
R317
4.7K
R315
3.3K
R316
33K
R312
12K
C307
200P
R313
33K
SW301-2
REC PLAY
R318
920
C310
16V10
L301
82 UH
C308
16V470
RT301
G4S-1112P-1-B-19
D301
1N4002
LEAF PLAY OFF
SWITCH FF REW ON
SW302 LSA-1115TN
CP303 848-EH-A
LEAF SWITCH
C309
0.022
CO301 8310074A
PLAY ON INPUT
DATA OUT
DATA IN
+5V
GND
MOTOR
PCB301
HT0003

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

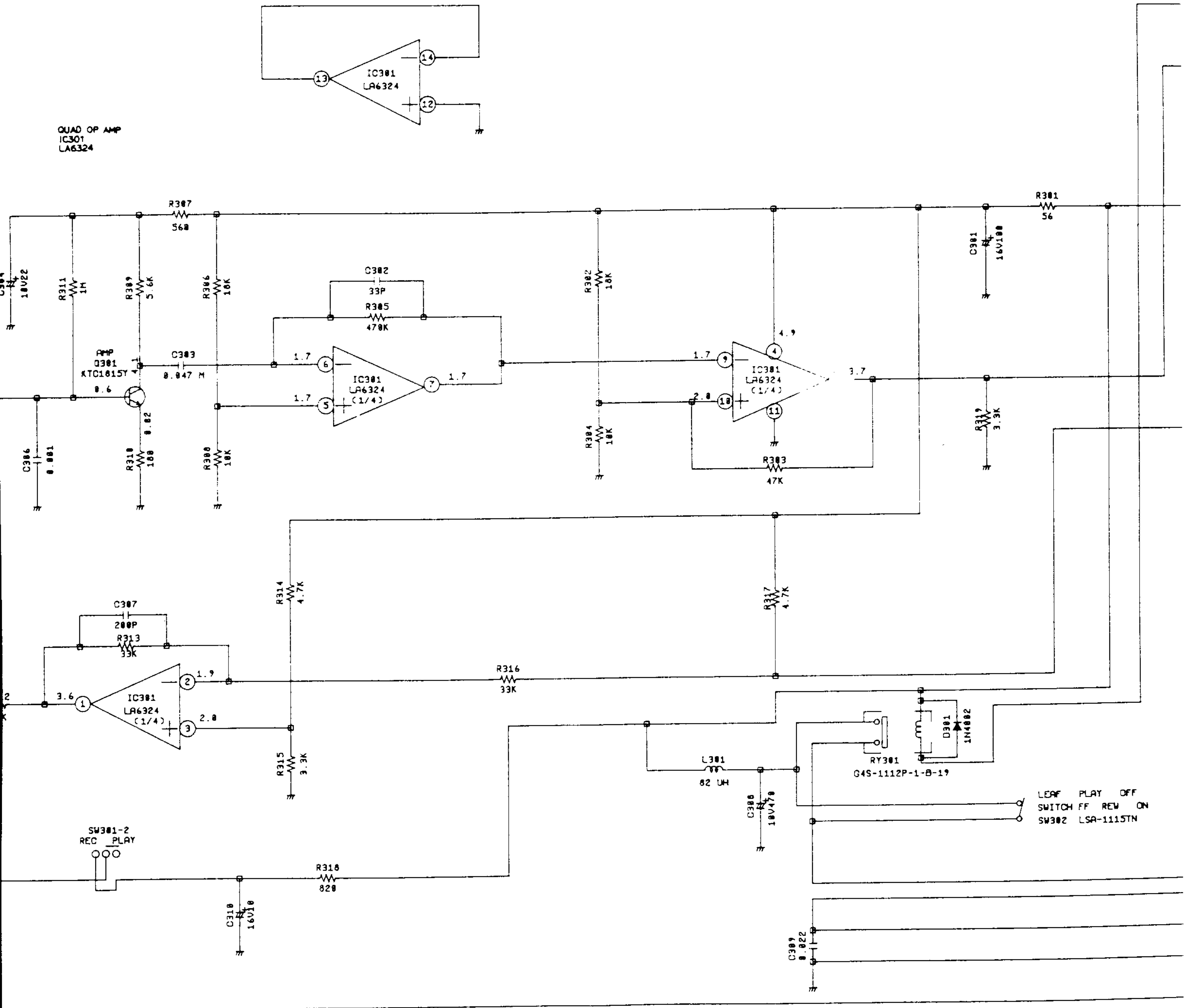
SCHEMAT
CASSETT


IC301
LA6324
13
14
12
QUAD OP AMP
IC301
LA6324
R307
560
C304
10V22
R311
1M
R309
5.6K
R306
10K
C302
33P
R305
470K
AMP
Q301
KTC1815Y
4.1
0.6
0.02
C303
0.047 M
1.7
6
5
7
IC301
LA6324
(1/4)
1.7
1.7
C305
50V0.47
848-EH-4
CP302
SW301-1 CL106A
REC PLAY
4
3
R/P HEAD
C306
0.001
R310
100
R308
10K
R314
4.7K
C307
200P
R313
33K
R316
33K
R312
12K
3.6
1
2
3
1.9
2.0
IC301
LA6324
(1/4)
R315
3.3K
SW301-2
REC PLAY
R318
820
C310
16V10
2
1
E HEAD
PCB301
MT0003

NOTE: THIS SCHEMATIC D
OF PRINTING AND

SCHEMATIC DIAGRAM

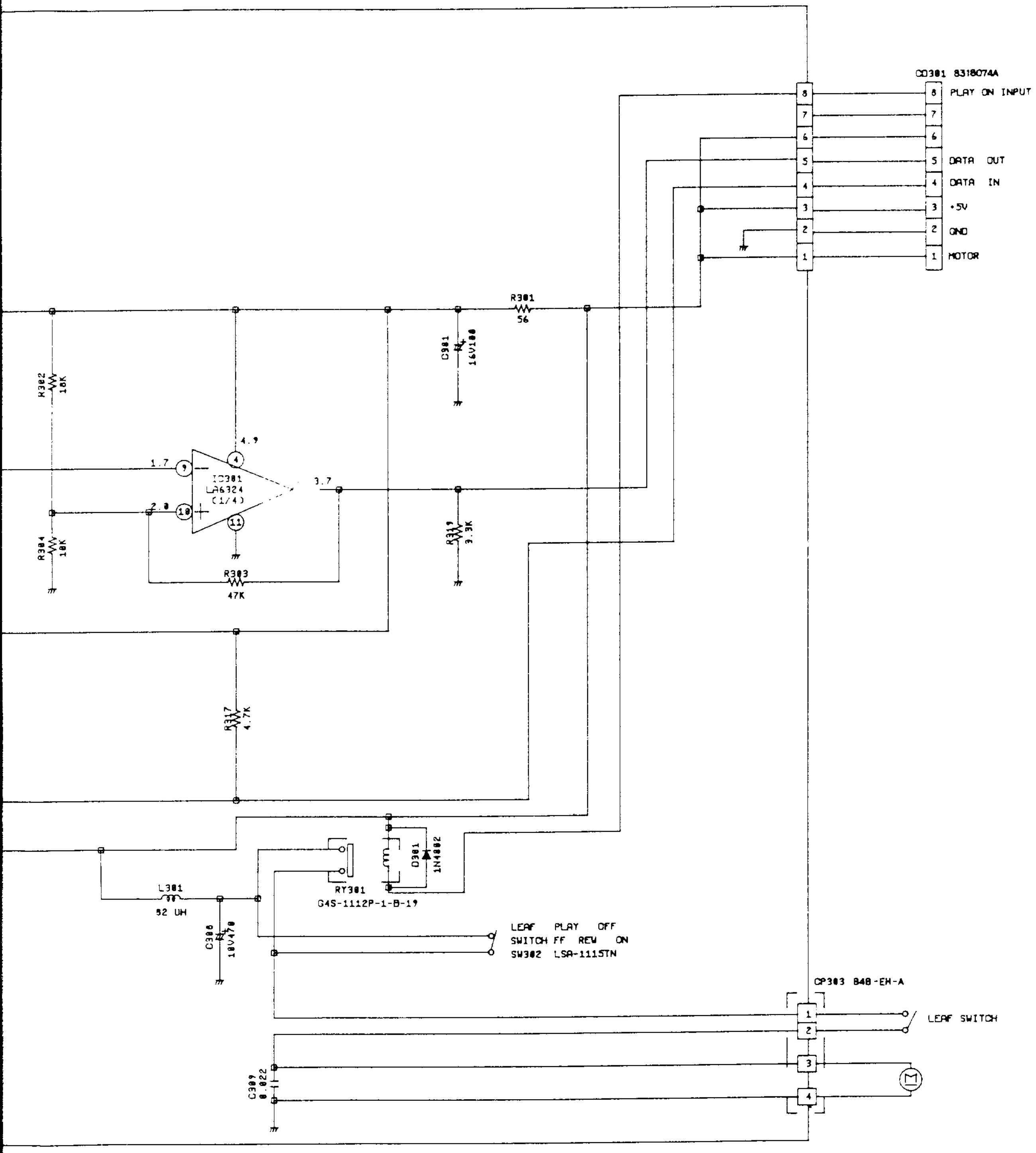
CASSETTE INTERFACE


QUAD OP AMP
IC301
LA6324
IC301 LA6324
13
14
12
R307 560
R301 56
C304 10V22
R311 1M
R309 5.6K
R306 10K
C302 33P
R305 470K
R302 10K
C301 16V100
AMP
Q301
KTC1815Y
0.6
0.02
C303 0.047 M
1.7
6
5
7
IC301 LA6324 (1/4)
9
10
4
11
4.9
2.0
3.7
C306 0.001
R310 100
R308 10K
R304 10K
R303 47K
R319 3.3K
R314 4.7K
R317 4.7K
C307 200P
R313 33K
R316 33K
IC301 LA6324 (1/4)
1
2
3
3.6
1.9
2.0
R315 3.3K
L301 82 UH
C308 10V470
RY301 G4S-1112P-1-B-19
D301 1N4002
LEAF SWITCH
PLAY FF REW
OFF ON
SW302 LSA-1115TN
SW301-2
REC PLAY
R318 820
C310 16V10
C309 0.022

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

ATIC DIAGRAM

TE INTERFACE


CD301 8318074A
8 PLAY ON INPUT
7
6
5 DATA OUT
4 DATA IN
3 +5V
2 GND
1 MOTOR
R301
56
C901
16V100
R302
10K
4.9
1.7
9
4
IC301
LA6324
(1/4)
3.7
2.0
10
11
R304
10K
R319
3.3K
R303
47K
R317
4.7K
D301
1N4002
RY301
G4S-1112P-1-B-19
L301
52 UH
C308
10V470
LEAF SWITCH PLAY FF REW OFF ON
SW302 LSA-1115TN
CP303 848-EH-A
1
2
3
4
LEAF SWITCH
C309
0.022
M

ATIC DIAGRAM IS THE LATEST AT THE TIME
G AND SUBJECT TO CHANGE WITHOUT NOTICE.

KEY MATRIX
(Applies to 464 & 6128)

UNDER FLEX
CP103

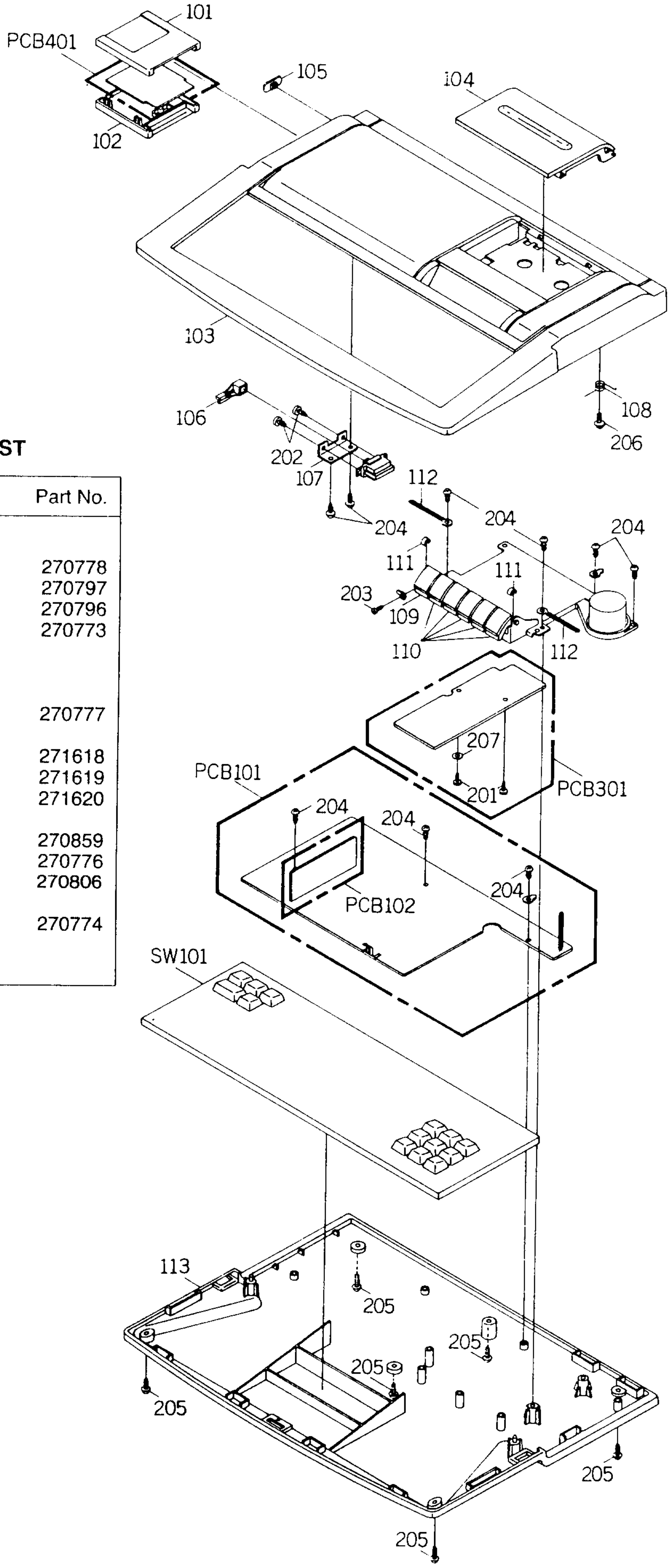
OVER FLEX
CP104

PIN NO.		②	③	④	⑤	⑥	⑦	⑧	⑨
		X1	X2	X3	X4	X5	X6	X7	X8
⑩	Y10								DEL
⑨	Y9	! 1	" 2	ESC	Q	TAB	A	CAPS LOCK	Z
⑧	Y8	$ 4	# 3	E	W	S	D	C	X
⑦	Y7	& 6	% 5	R	T	G	F	B	V
⑥	Y6	(8	' 7	U	Y	H	J	N	SPACE
⑤	Y5	_ 0	) 9	O	I	L	K	M	< ,
④	Y4	£ ↑	= -	| @	P	+ ;	* :	? /	> .
③	Y3	CLR	{ [	RETURN	}]	f4	SHIFT	` \	CONTROL
②	Y2	←	COPY	f7	f8	f5	f1	f2	f0
①	Y1	↑	→	↓	f9	f6	f3	ENTER	•

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

SW101 ESU44LN027AA

MECHANICAL EXPLODED VIEW


101
PCB401
105
104
102
103
106
108
206
202
107
112
204
204
204
204
111
111
203
109
110
112
207
201
PCB101
PCB301
204
204
PCB102
204
SW101
113
205
205
205
205
205
205

CPC 464 PLUS CABINET PARTS LIST

Ref. No.	Description	Part No.
Cabinet Parts		
101	Cartridge ASSY (UK)	270778
101	Cartridge ASSY (Spain)	270797
101	Cartridge ASSY (France)	270796
103	Cabinet Top ASSY	270773
	Cabinet Top	
	Plate Brand	
	Plate Reflection	
104	Lid Cassette	270777
	Plate Cassette Lid	
105	Button Power (A)	271618
106	Button Power (B)	271619
107	Bracket Power Switch	271620
108	Spring Cassette Lid	
109	Button Deck (REC)	270859
110	Button Deck	270776
111	Spacer Button Deck	270806
112	Cord Clamp No PEC-034-0	
113	Cabinet Bottom Assy	270774
	Leg Rubber	
	Sheet Rating	

464 PLUS ELECTRICAL PARTS LIST

Ref. No.	Description	Part No.
IC's		
IC101	IC AMS40489	40489
IC102	IC Z8400AB1N	40080
IC108	IC MC74HC4051N	270752
IC109	IC LA6393D	270997
IC110, 111	IC KM41464AP-12	40239
IC114	IC AY-3-8912	40001
IC115	IC AMS40464	40464
IC116	IC PC74HCTO2P	270999
IC301	IC LA6324	170112
Transistor		
Q101, 103-107, 301	TR KTC1815 Y-T	170447
Diodes		
D101	D LED SLZ-255B-21A/BT1	170866
D110, 111, 120-127, 201, 202	D 1SS132T-77	171582
D128-130	D MTZ4.7BT-77 ZENER	175021
D301	D 1N4002 RECT	175440
Coils and Inductors		
L101	Filter Line ESD-R-12C	270751
L301	Coil Inductor LAL03TA820K	270798
Switches		
SW101	Switch Keyboard ESU44LN027AA (UK)	270779
SW101	Switch Keyboard ESU44LN027DA (Spain)	270795
SW101	Switch Keyboard ESU44LN027CA (France)	270794
SW102	Switch Slide ESD-3975	170002
SW301	Switch Slide CL106A	270753
SW302	Switch Leaf LSA-1115TN	270755
PCB's		
PCB101	PCB ASSY MC0122	
PCB102	PCB ASSY MS0189	
PCB103	PCB ASSY MS0190	
PCB301	PCB ASSY MT0003	
PCB401	PCB ASSY MC0121	
Miscellaneous		
NR102	Res. Network EXB-P88222J	270800
PD001	Paddle 140Z001-40991	270792
RY301	Relay G4S-1112P-1-B-19	170123
X102	Crystal CX0-824C 40MHz	270772
CTD01	Cassette Deck TN-21ZH-754	270775
345	RF Belt	270805
347	Main Belt	270807
350	Motor	270858
Jacks		
J101	Jack Modular 215876-1	271010
J102	Jack Din CSK150-81-30-244	271011
J103	Jack RCA 3.5 HSJ1061-01-440	271012
J104	Jack DC HEC0470-01-640	271008
J105	Socket IC DILB40P-1115TN	
Variable Resistors		
VR101 VRSF	VG042M102	271609

Ref. No.	Description	Part No.
Resistors: Carbon 1/6W		
22 OHM	R105, 189, 192	152156
33 OHM	R146-154, 156, 157, 168, 169	152158
82 OHM	R180	152164
91 OHM	R172	152165
120 OHM	R181	152167
150 OHM	R113	152168
220 OHM	R187, 195, 198	152170
330 OHM	R175	152172
470 OHM	R186	152174
680 OHM	R174, 182	152176
910 OHM	R171	250430
1K OHM	R104, 161-163, 190	152179
1.2K OHM	R173	152180
1.1K OHM	R102, 103, 115, 116, 118-120	152183
3.3K OHM	R176-178, 184, 188	152185
4.7K OHM	R101, 127, 210	152188
5.6K OHM	R183	152189
10K OHM	R114, 117, 129, 130, 158-160, 164, 167	152194
15K OHM	R179	152196
22K OHM	R165, 166, 191	152198
100K OHM	R194, 197	152209
180K OHM	R123-126	152212
220K OHM	R193, 196	152213
Resistors: Carbon 1/4W		
56 OHM	R301	240507
100 OHM	R310	193588
560 OHM	R307	193196
820 OHM	R318	10054
3.3K OHM	R315, 319	193597
4.7K OHM	R314, 317	240510
5.6K OHM	R309	10079
10K OHM	R304, 308	240511
12K OHM	R312	10087
18K OHM	R302, 306	193700
33K OHM	R313, 316	193703
47K OHM	R303	240512
470K OHM	R305	193708
1M OHM	R311	193710
Resistors: Metal 1/6W		
1K OHM	R132, 134, 136, 138, 140, 142	271025
2K OHM	R131, 133, 135, 137, 139, 141, 143, 144	271026
6.34K OHM	R170	270785
Capacitors: Ceramic		
33PF 50V	C302	150514
100PF 50V	C127, 131	24016
200PF 50V	C307	240234
330PF 50V	C124, 125	193722
0.001UF 50V	C306	157679
0.022UF 50V	C309	21027
0.1UF 12V	C101, 102, 108, 110, 111, 114, 115, 117, 118, 401	175181
Capacitors: Electrolytic		
0.47UF 50V	C305	157670
1UF 50V	C137, 138	157563
1OUF 16V	C126, 132, 134, 310	157581
22UF 10V	C304	270042
47UF 16V	C151	157629
100UF 10V	C135	193226
100UF 16V	C301	157568
470UF 10V	C130, 136, 308	270963
Capacitors: Polyester		
0.047UF 10V	C1303	170442

6128 ELECTRICAL ADJUSTMENT

LUMI. SIGNAL OUTPUT LEVEL

1. Connect the oscilloscope to 3 pin of J102.
2. Adjust VR101 so that the signal becomes 1.65V as shown in Fig. 1.

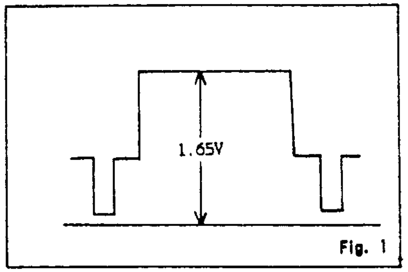
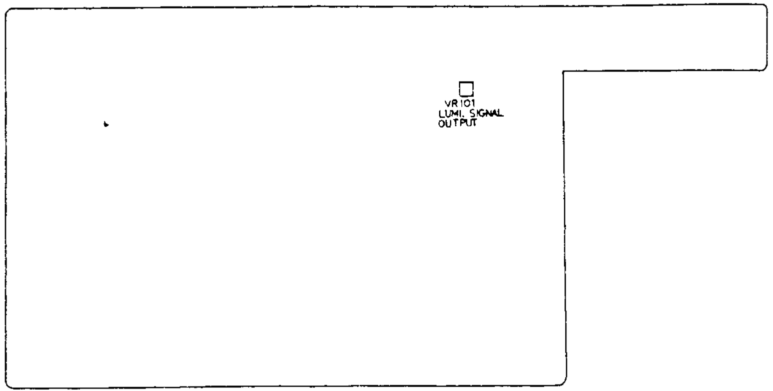


Fig. 1

MAJOR COMPONENTS LOCATION GUIDE



MAIN P.C.BOARD

6128 PLUS TECHNICAL SPECIFICATION

LSI CHIPS
Z80A processor running at 4MHz.
128K of RAM arranged in two 64K banks (over 41K available when using BASIC, 61K available to CP/M Plus).
128K byte ROM cartridge containing BASIC firmware and "Burnin' Rubber" game.
GI AY-3-8912 3 voice, 8 octave sound generator chip.
Application Specific Integrated Circuit (ASIC) containing 18,000 gates. Includes emulation of 6845 video controller and 8255 parallel peripheral interface. Chip also contains 16,000 bits of storage for sprite data.
upd765A disk controller.
3" 170K built-in disk drive compatible with CPC models. Supplied disk contains CP/M Plus operating system.
36 way Amphenol connector for second disk drive.

DISPLAY SPECIFICATION (BASIC)

Display Mode	Mode 1	Mode 2	Mode 3
No. of colours	4 from 27	2 from 27	16 from 27
Vertical dots	200	200	200
Horiz. dots	320	640	160
Characters	40 × 25	80 × 25	20 × 25

DISPLAY SPECIFICATION (CARTRIDGE GAMES)
16 mode independent sprites are available in 16 different colours from those used to draw the main screen.
Both sprite colours and main screen colours may now be chosen from a palette of 4096. (16 levels of Red, Green and Blue).

Display Mode	Mode 1	Mode 2	Moce 3
No. of colours	4 from 4096	2 from 4096	16 from 4096
No. Sprites	16	16	16
Sprite colours	16 from 4096	16 from 4096	16 from 4096

EXTRA FEATURES (CARTRIDGE GAMES)
Analogue joystick support.
Soft Scroll allows pixel-wise movement in vertical and horizontal for fast action games.
Split Screen allows two separate areas to be displayed at once alleviating the need to re-draw score bars etc.
DMA driven sound allows tunes to play without processor intervention.
Raster Interrupt allows games to change mode and colours at fixed points on the screen.

KEYBOARD
74 keys – QWERTY style, numeric cluster, cursor and copy cursor, large enter, shift, caps lock, tab, escape, delete, clear, control.

DATACORDER
Write speed software selectable – 1K baud or 2K baud, read speed automatically established by software. Write protect interlock. Motor on/off controlled by software.

ADD-ON ABILITY
8 bit Centronics compatible printer.
1 or 2 digital joysticks or paddles.
IBM Standard analogue joystick. (Some cartridge games).
Light gun.
Various peripherals.
ROM cartridge up to 512K byte capacity.

EXTERNAL SOCKETS
3.5 mm stereo jack plug for connection to external amplifier.
2 × 9 Pin D-type digital paddle/joystick connectors.
15 Pin D-type analogue joystick connector (IBM Standard).
RJ11 "telephone" jack for connection of light gun.
25 way D-type connector for 8 bit Centronics interface.
50 way Amphenol style connector with full Z80 bus for addition of other devices (e.g. serial interface).
8 Pin DIN socket for RGB, sync, Luminance and stereo sound connection to monitor.
5 mm socket for connection of 5V power supply for monitor.

DIMENSIONS mm (approx.)

	Width	Height	Depth
Computer	398	46	297
MM12 mono motor	329	308	307
CM14 colour monitor	377	348	360
Paddle controller	124	22	56

POWER SUPPLY
MM12 Monitor: 240V AC (UK), 220V AC (Europe) 50Hz.
CM14 Monitor: 220-240V AC 50Hz.

6128 ELECTRICAL ADJUSTMENT

LUMI. SIGNAL OUTPUT LEVEL

1. Connect the oscilloscope to 3 pin of J102.
2. Adjust VR101 so that the signal becomes 1.65V as shown in Fig. 1.

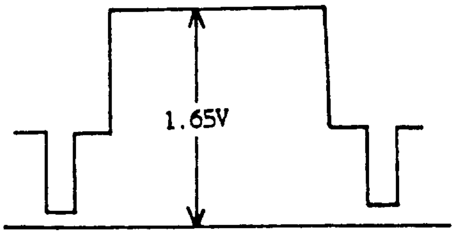
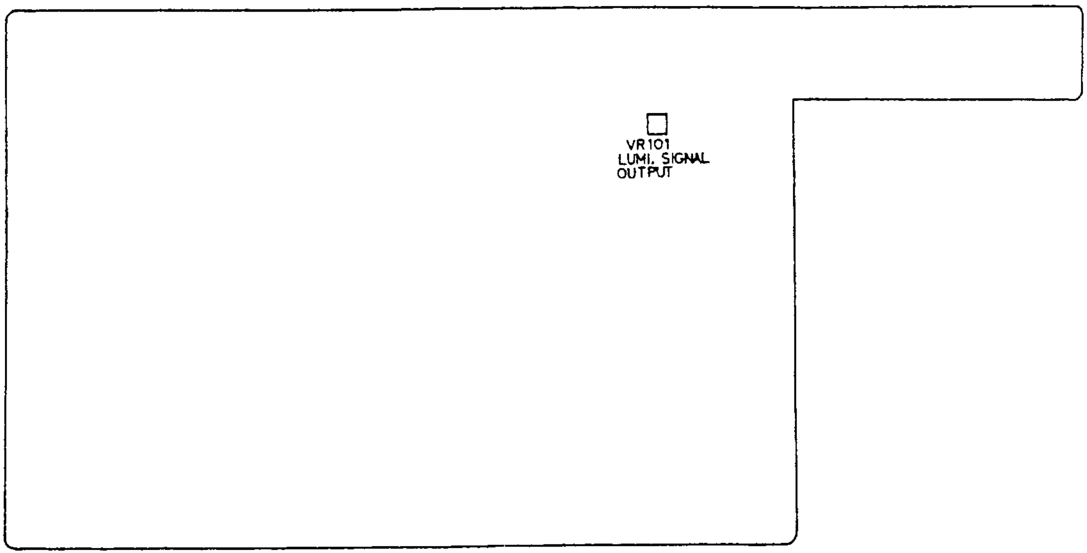


Fig. 1

MAJOR COMPONENTS LOCATION GUIDE


VR101
LUMI. SIGNAL
OUTPUT

MAIN P.C.BOARD

6128
SECTION

6128 PLUS TECHNICAL SPECIFICATION

LSI CHIPS

Z80A processor running at 4MHz.
128K of RAM arranged in two 64K banks (over 41K available when using BASIC, 61K available to CP/M Plus).
128K byte ROM cartridge containing BASIC firmware and "Burnin' Rubber" game.
GI AY-3-8912 3 voice, 8 octave sound generator chip.
Application Specific Integrated Circuit (ASIC) containing 18,000 gates. Includes emulation of 6845 video controller and 8255 parallel peripheral interface. Chip also contains 16,000 bits of storage for sprite data.
upd765A disk controller.
3" 170K built-in disk drive compatible with CPC models. Supplied disk contains CP/M Plus operating system.
36 way Amphenol connector for second disk drive.

DISPLAY SPECIFICATION (BASIC)

Display Mode	Mode 1	Mode 2	Mode 3
No. of colours	4 from 27	2 from 27	16 from 27
Vertical dots	200	200	200
Horiz. dots	320	640	160
Characters	40 × 25	80 × 25	20 × 25

DISPLAY SPECIFICATION (CARTRIDGE GAMES)

16 mode independent sprites are available in 16 different colours from those used to draw the main screen.
Both sprite colours and main screen colours may now be chosen from a palette of 4096. (16 levels of Red, Green and Blue).

Display Mode	Mode 1	Mode 2	Mode 3
No. of colours	4 from 4096	2 from 4096	16 from 4096
No. Sprites	16	16	16
Sprite colours	16 from 4096	16 from 4096	16 from 4096

EXTRA FEATURES (CARTRIDGE GAMES)

Analogue joystick support.
Soft Scroll allows pixel-wise movement in vertical and horizontal for fast action games.
Split Screen allows two separate areas to be displayed at once alleviating the need to re-draw score bars etc.
DMA driven sound allows tunes to play without processor intervention.
Raster Interrupt allows games to change mode and colours at fixed points on the screen.

KEYBOARD

74 keys – QWERTY style, numeric cluster, cursor and copy cursor, large enter, shift, caps lock, tab, escape, delete, clear, control.

DATACORDER

Write speed software selectable – 1K baud or 2K baud, read speed automatically established by software. Write protect interlock. Motor on/off controlled by software.

ADD-ON ABILITY

8 bit Centronics compatible printer.
1 or 2 digital joysticks or paddles.
IBM Standard analogue joystick. (Some cartridge games).
Light gun.
Various peripherals.
ROM cartridge up to 512K byte capacity.

EXTERNAL SOCKETS

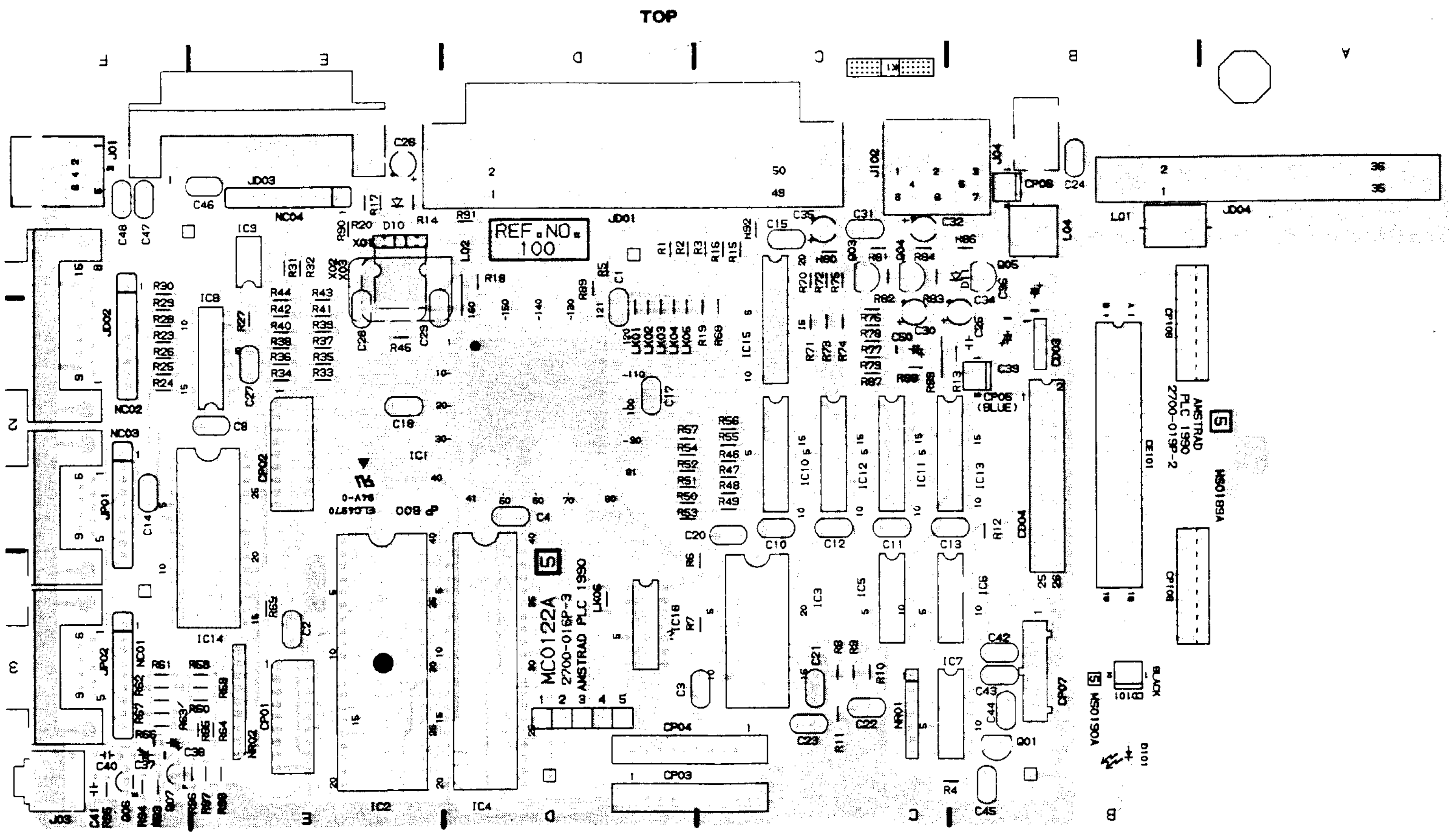
3.5 mm stereo jack plug for connection to external amplifier.
2 × 9 Pin D-type digital paddle/joystick connectors.
15 Pin D-type analogue joystick connector (IBM Standard).
RJ11 "telephone" jack for connection of light gun.
25 way D-type connector for 8 bit Centronics interface.
50 way Amphenol style connector with full Z80 bus for addition of other devices (e.g. serial interface).
8 Pin DIN socket for RGB, sync, Luminance and stereo sound connection to monitor.
5 mm socket for connection of 5V power supply for monitor.

DIMENSIONS mm (approx.)

	Width	Height	Depth
Computer	398	46	297
MM12 mono motor	329	308	307
CM14 colour monitor	377	348	360
Paddle controller	124	22	56

POWER SUPPLY
MM12 Monitor: 240V AC (UK), 220V AC (Europe) 50Hz.
CM14 Monitor: 220-240V AC 50Hz.

PRINTED CIRCUIT BOARDS
MAIN/CASSETTE HOLD/LED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2700-016P-3
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AMSTRAD
PLC 1990
2700-019P-2
MS0189A
MS0190A
BLACK
(BLUE)
JD01
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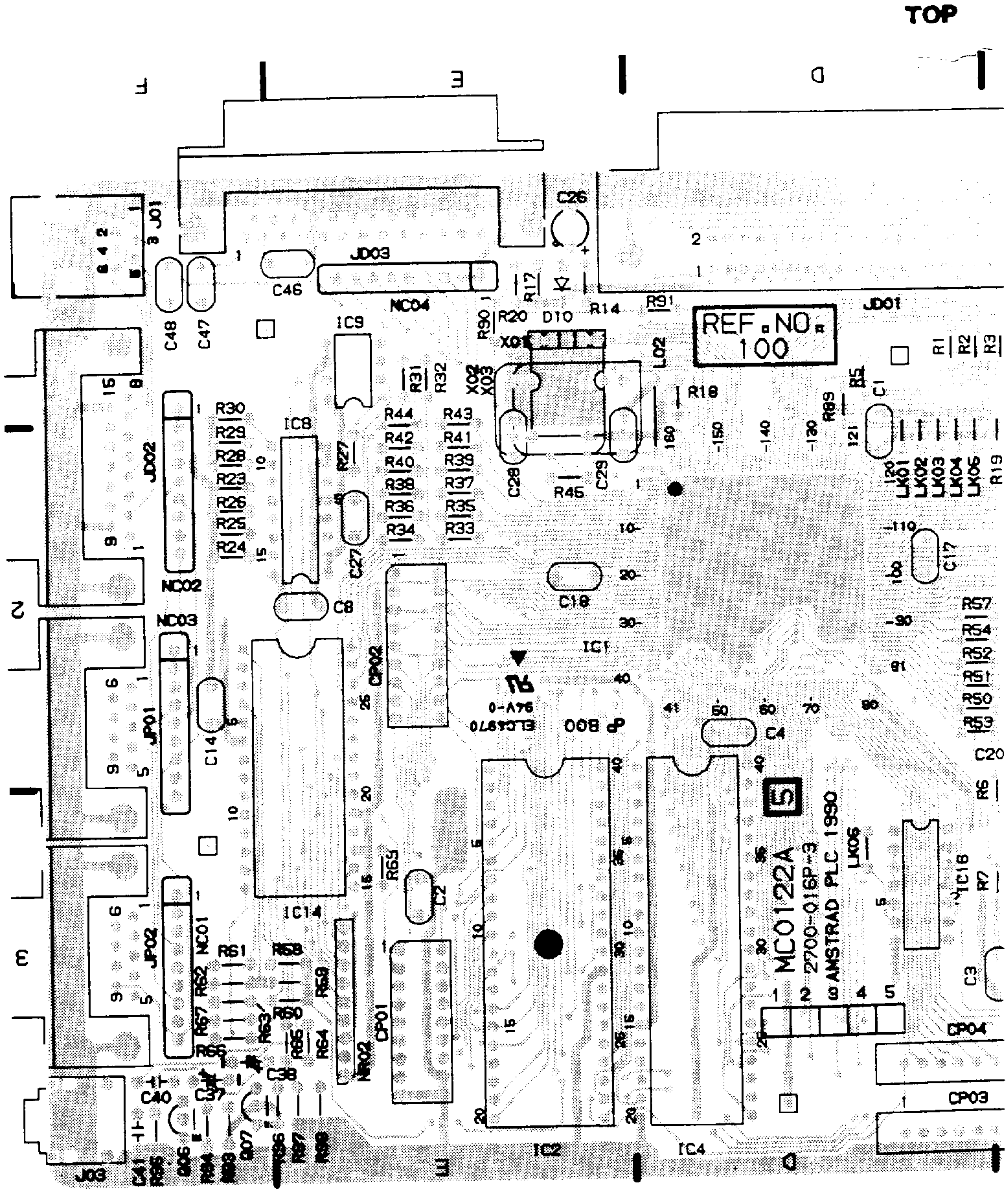
R98
ELC4370
94V-0
ΦP 800

PRINTED CIR

MAIN/CASSET



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CP04
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IC4
IC8
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IC14
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2700-016P-3
AMSTRAD PLC 1990
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C38
C40
C41
C46
C47
C48
D10
X01
X02
X03
L02
LK01
LK02
LK03
LK04
LK05
LK06
R1
R2
R3
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R58
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R89
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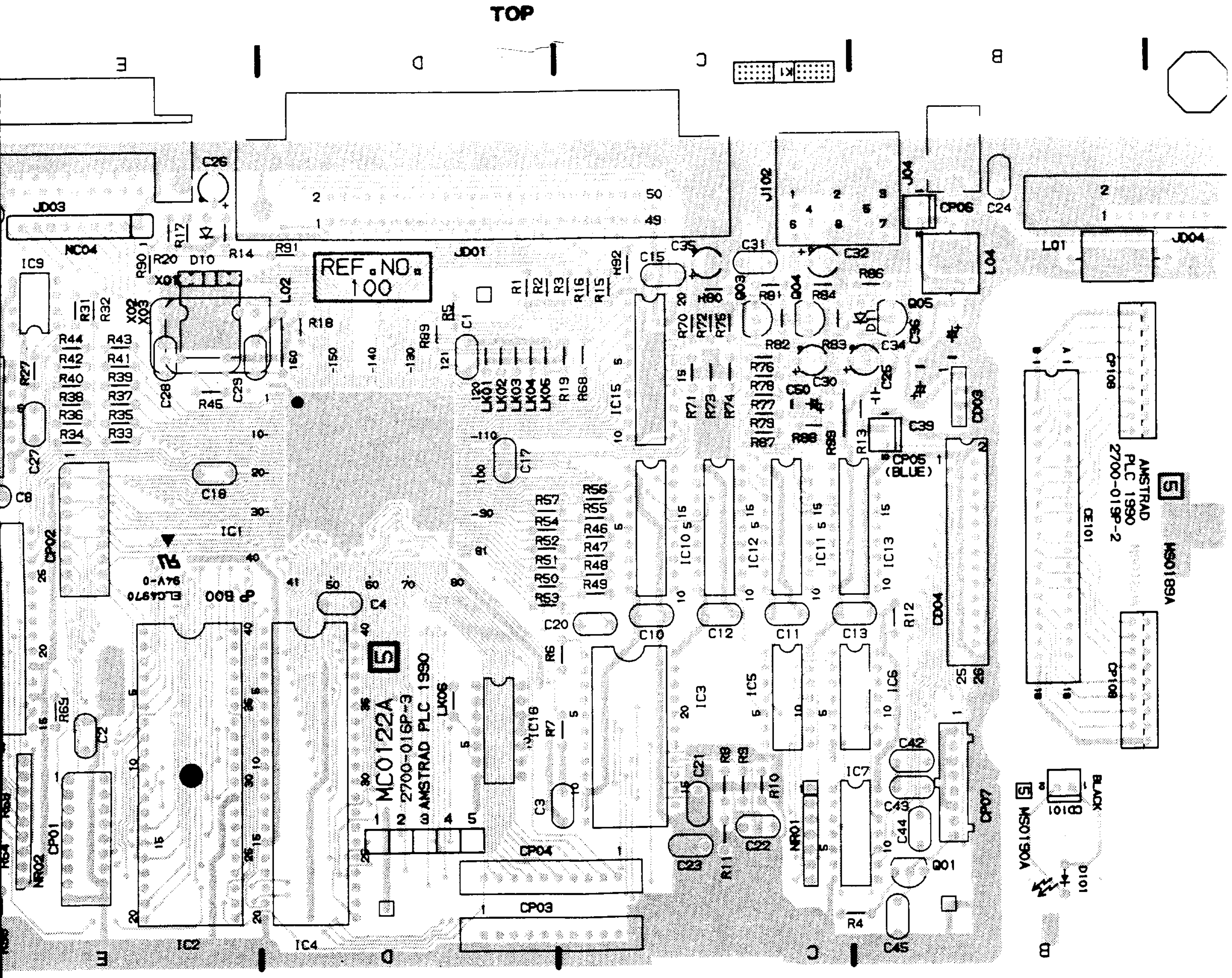
R91
Q06
Q07

PRINTED CIRCUIT BOARDS
MAIN/CASSETTE HOLD/LED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C31
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C15
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X03
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R32
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R15
R80
Q03
R81
Q04
R84
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IC15
R70
R72
R75
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C34
C30
C25
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CD03
CP108
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C18
C8
CP02
IC1
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R57
R54
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IC11
IC13
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MC0122A
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AMSTRAD PLC 1990
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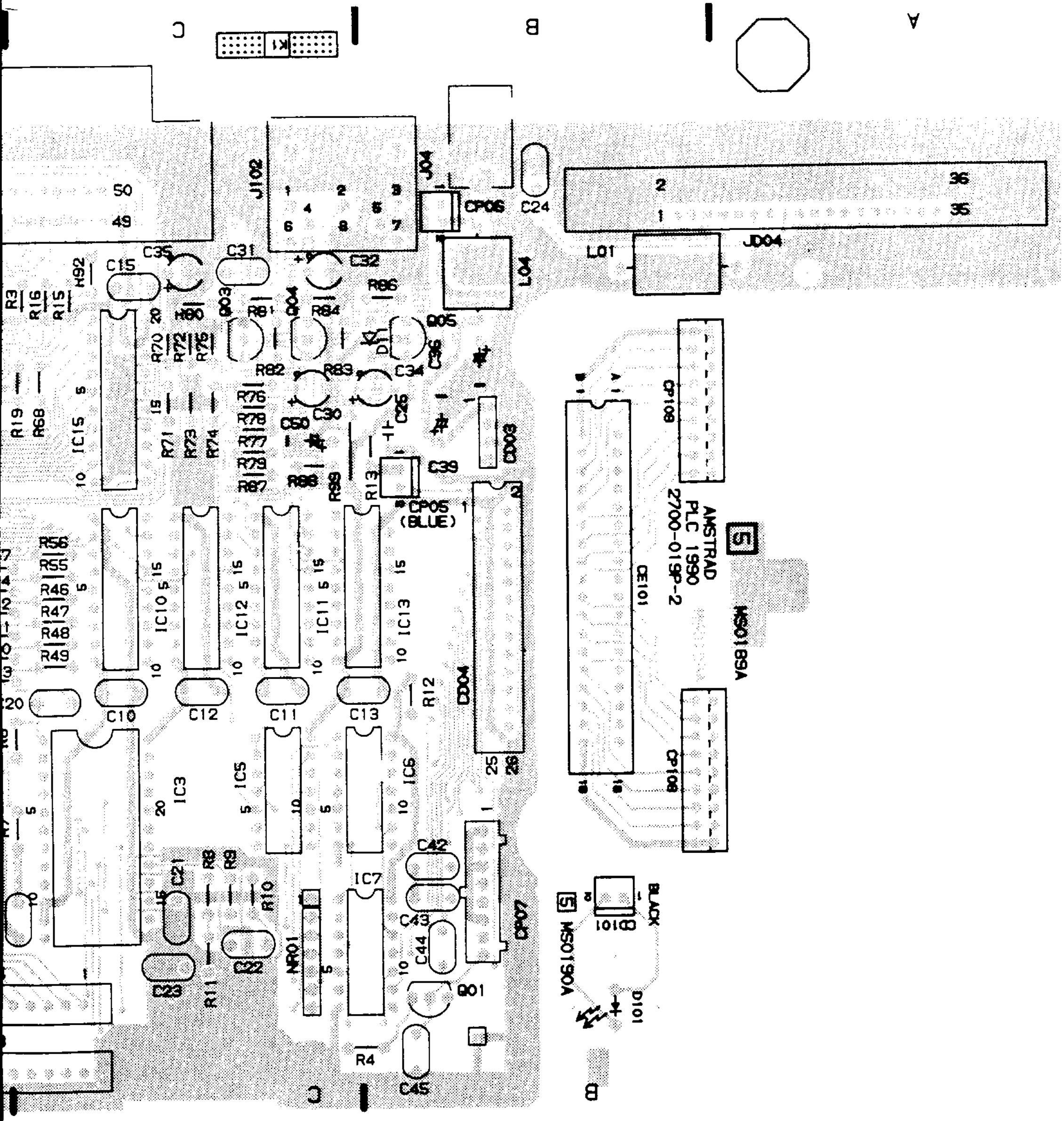
IC4

RCUIT BOARDS

ETTE HOLD/LED



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R13
CP05 (BLUE)
CD03
CP108
CE101
AMSTRAD PLC 1990 2700-019P-2
MS0189A
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IC13
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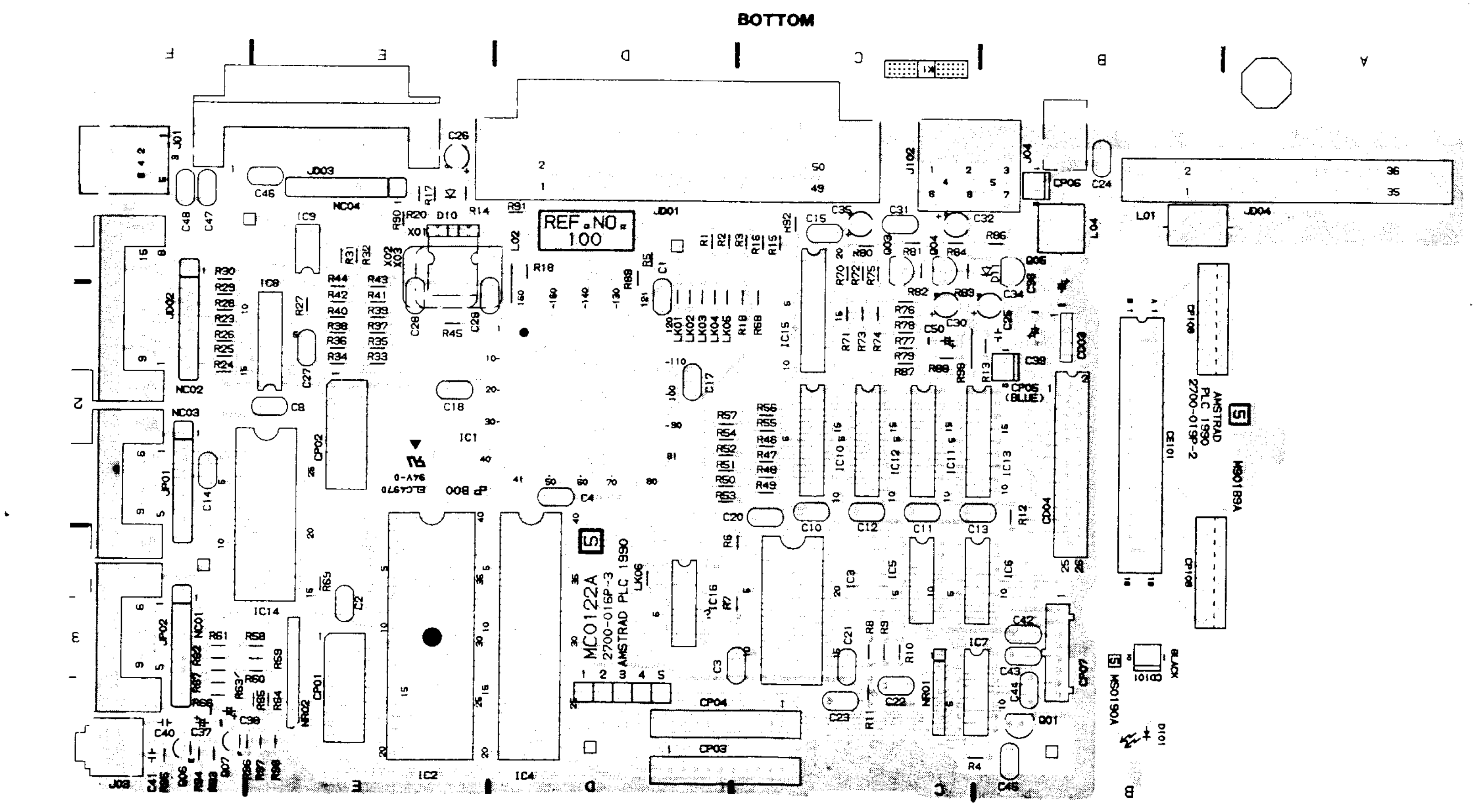
PRINTED CIRCUIT BOARD
MAIN/CASSETTE HOLD/LED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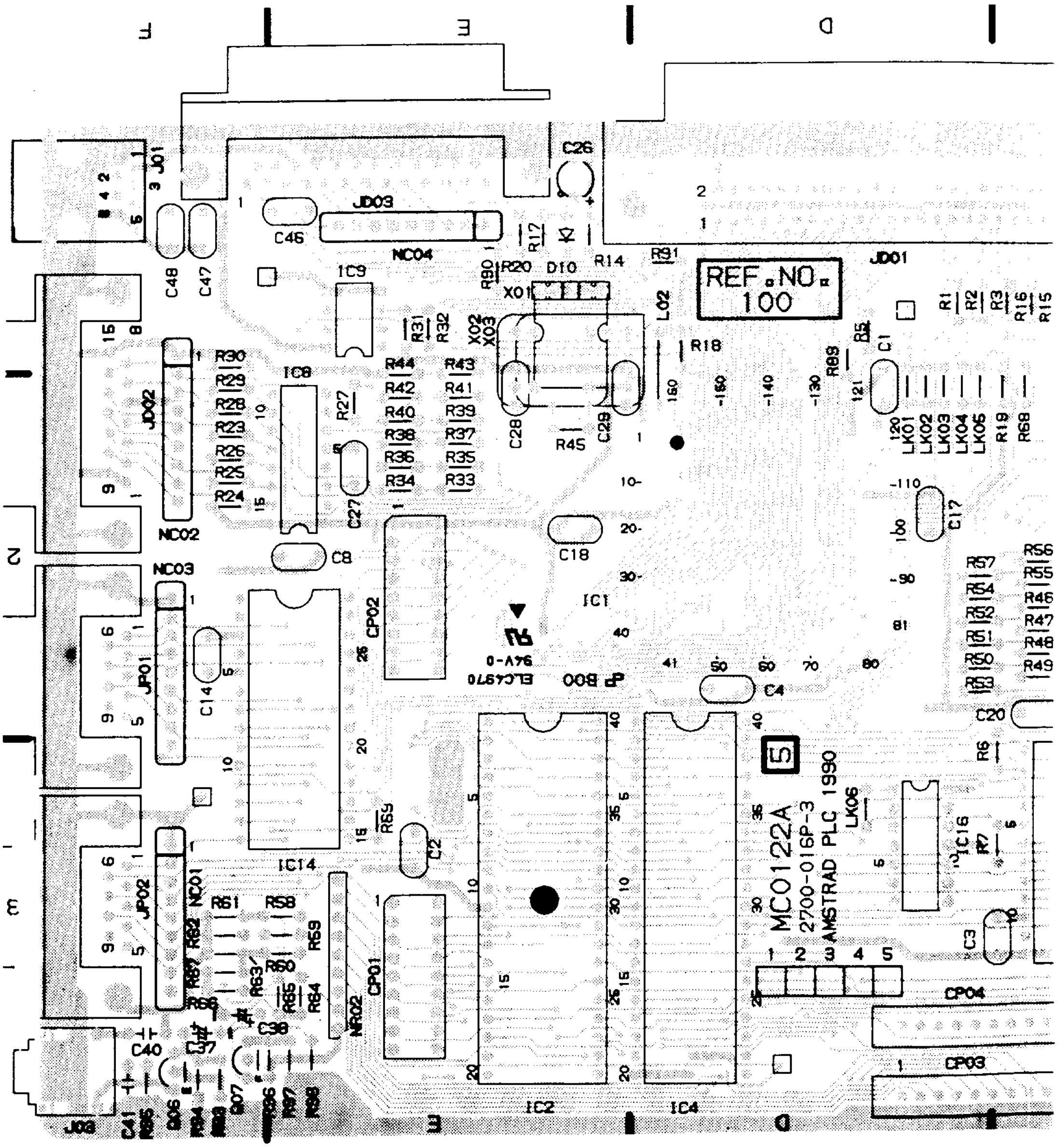
PRINTED CIRC

MAIN/CASSETT

BOTT



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MC0122A
2700-016P-3
AMSTRAD PLC 1990
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C38
J03
C41
R95
D06
R94
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R98
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IC4
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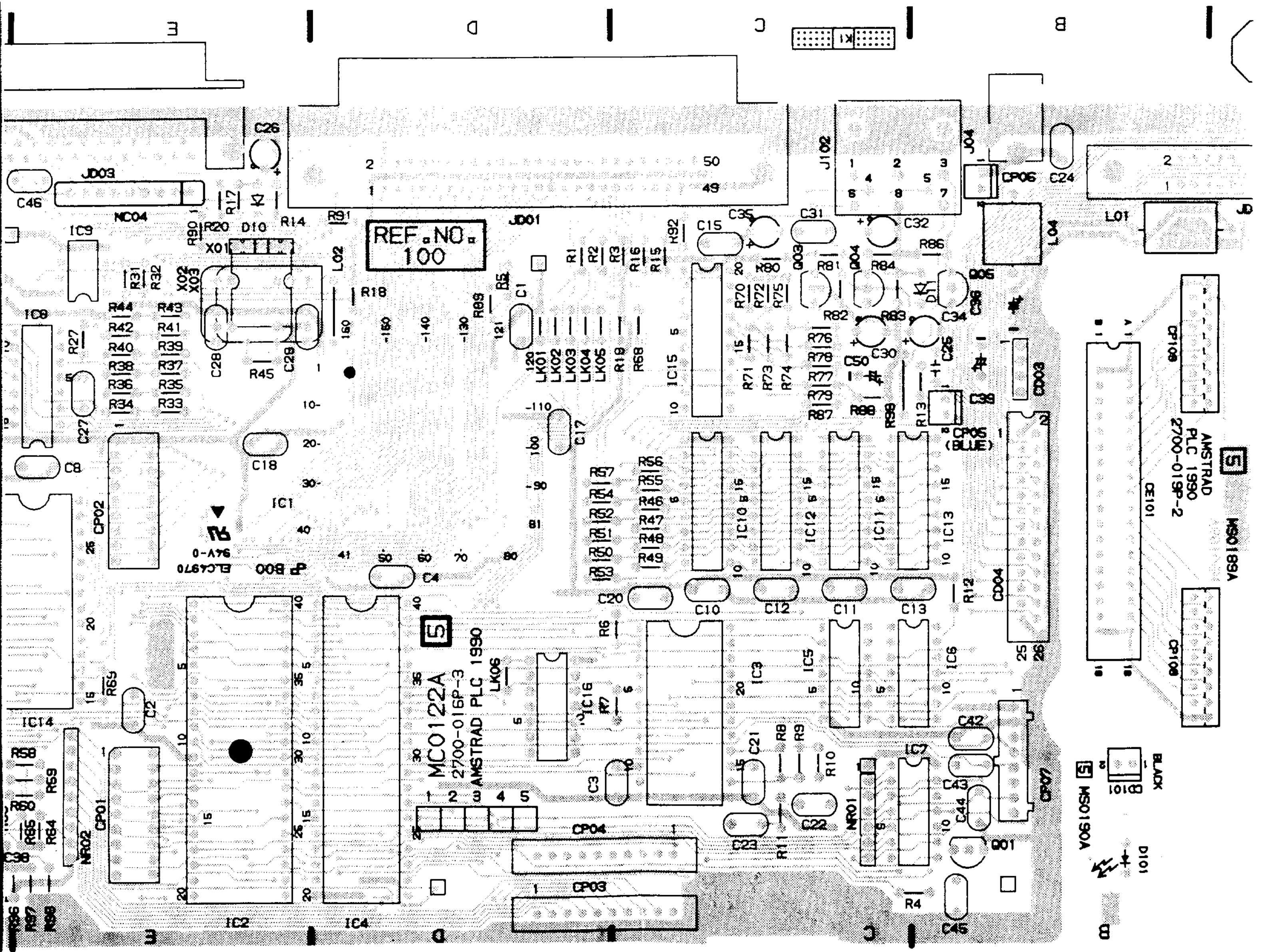
PRINTED CIRCUIT BOARD
MAIN/CASSETTE HOLD/LED

BOTTOM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R20
D10
R14
R91
X01
L02
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1
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J04
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L04
IC9
IC8
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R32
X02
X03
R18
C1
R89
R5
R1
R2
R3
R16
R15
H92
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C35
C31
C32
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Q04
Q05
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R82
R83
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C36
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R72
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R88
R98
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C30
C25
C39
R13
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(BLUE)
CD03
CP108
CE101
AMSTRAD
PLC 1990
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R52
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R48
R50
R49
R53
IC10
IC12
IC11
IC13
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CD04
CP106
C4
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C10
C12
C11
C13
R6
IC14
R63
C2
MC0122A
2700-016P-3
AMSTRAD PLC 1990
LK06
IC16
R7
IC3
IC5
IC6
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CP07
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CP01
NR02
C38
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C3
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C22
C23
R11
NR01
IC7
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CP03
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C45
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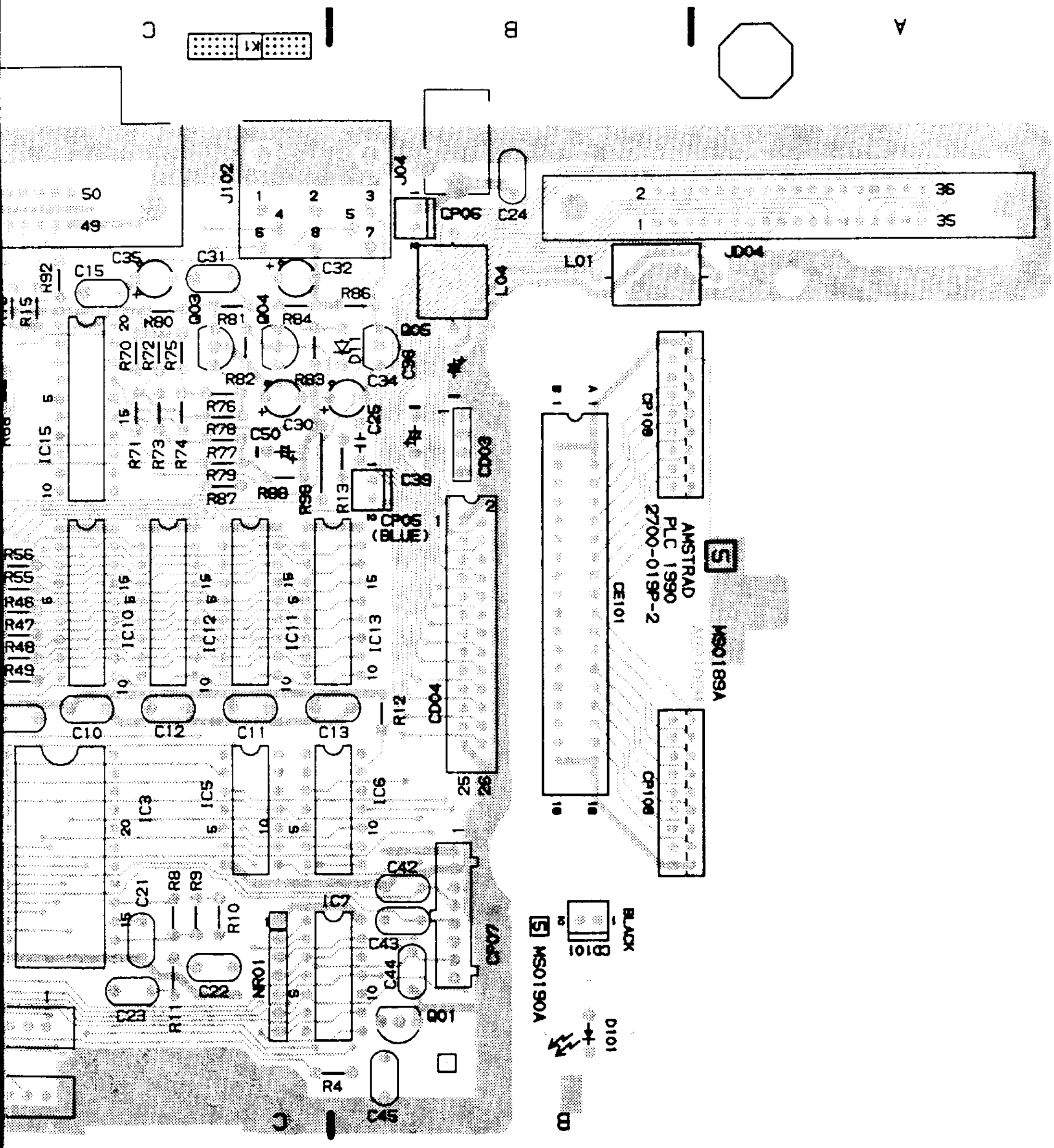
MS0190A
D101
IC2
IC4

RCUIT BOARD

TTE HOLD/LED

TTOM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IC11
IC13
R12
C10
C12
C11
C13
IC3
IC5
IC6
CE101
CP109
CP108
AMSTRAD
PLC 1990
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MS0189A
C21
R8
R9
R10
C42
IC7
C43
C44
NR01
C22
C23
R11
Q01
R4
C45
CP07
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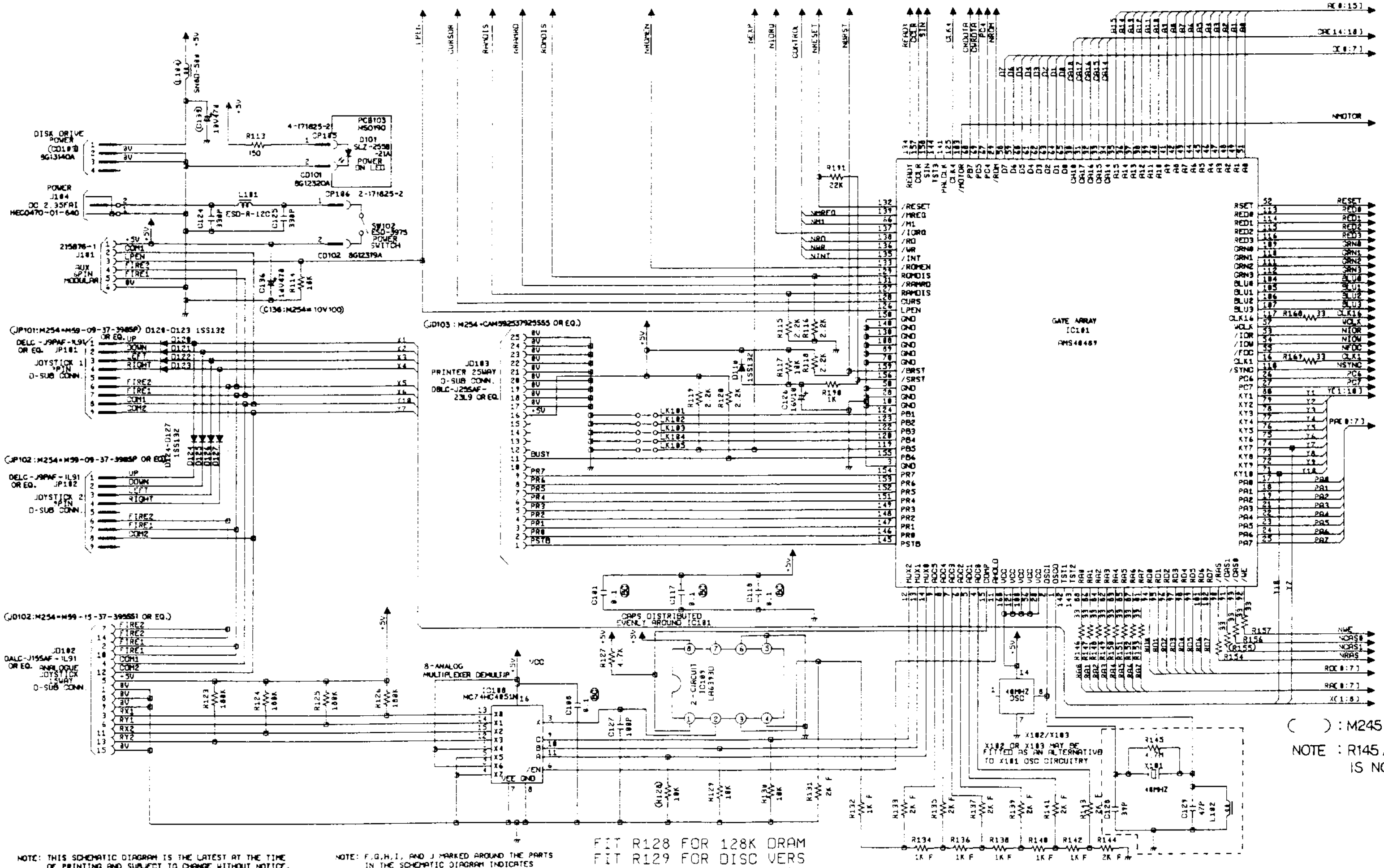
B101
BLACK
D101
25
26
20
15
10

GATE ARRAY / OUTPUT INTERFACE SCHEMATIC DIAGRAM


GATE ARRAY
IC101
AMS40489
DISK DRIVE POWER (CD103) 5G13140A
POWER J104 DC 2.35FAI HEC0470-01-640
215876-1 J101 AUX 6PIN MODULAR
PCB103 H50190
D101 SLZ-255B-21A POWER ON LED
CD101 8G12320A
CP106 2-171625-2
SW102 ESD-3975 POWER SWITCH
CD102 8G12379A
L101 ESD-R-12C
(C136:M254= 10V100)
(JP101:M254=H59-09-37-398SP) D120-D123 1SS132
DELC-J9PAF-IL91 OR EQ. JP101
JOYSTICK 1 9PIN D-SUB CONN.
(JP102:M254=H59-09-37-398SP OR EQ.)
DELC-J9PAF-IL91 OR EQ. JP102
JOYSTICK 2 9PIN D-SUB CONN.
D124-D127 1SS132
(JD102:M254=H59-15-37-395S1 OR EQ.)
JD102 DALC-J15SAF-IL91 OR EQ. ANALOGUE JOYSTICK 15WAY D-SUB CONN
(JD103 : M254=CAM592537925555 OR EQ.)
JD103 PRINTER 25WAY D-SUB CONN. DBLC-J25SAF-23L9 OR EQ.
8-ANALOG MULTIPLEXER DEMULTIP
IC108 MC74HC4051N
2-CIRCUIT IC109 LA6393D
CAPS DISTRIBUTED EVENLY AROUND IC101
16MHZ OSC
X102/X103
X102 OR X103 MAY BE FITTED AS AN ALTERNATIVE TO X101 OSC CIRCUITRY
16MHZ
LPEN
CURSOR
RAMDIS
RAMRD
ROMDIS
NROMEN
NEXP
NIORQ
CONTROL
NRESET
NRFST
READY
CCLR
SIN
CLK4
CMDUTR
CMDDTR
PD4
NROM
RC[0:15]
CRC[14:10]
CD[0:7]
NMOTOR
RESET
RED0
RED1
RED2
RED3
GRN0
GRN1
GRN2
GRN3
BLU0
BLU1
BLU2
BLU3
CLK16
VOLK
NIOR
NIOW
NFDC
CLK1
NSYNC
PC6
PC7
YC[1:10]
PR[0:7]
NWE
NCAS0
NCAS1
NRAS
ROC[0:7]
RAC[0:7]
X[1:8]
X1 X2 X3 X4 X5 X6 X7
UP DOWN LEFT RIGHT FIRE2 FIRE1 COM1 COM2
RX1 RY1 RX2 RY2
BUSY
PR7 PR6 PR5 PR4 PR3 PR2 PR1 PR0 PSTB
LK101 LK102 LK103 LK104 LK105
+5V
VCC
0V

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

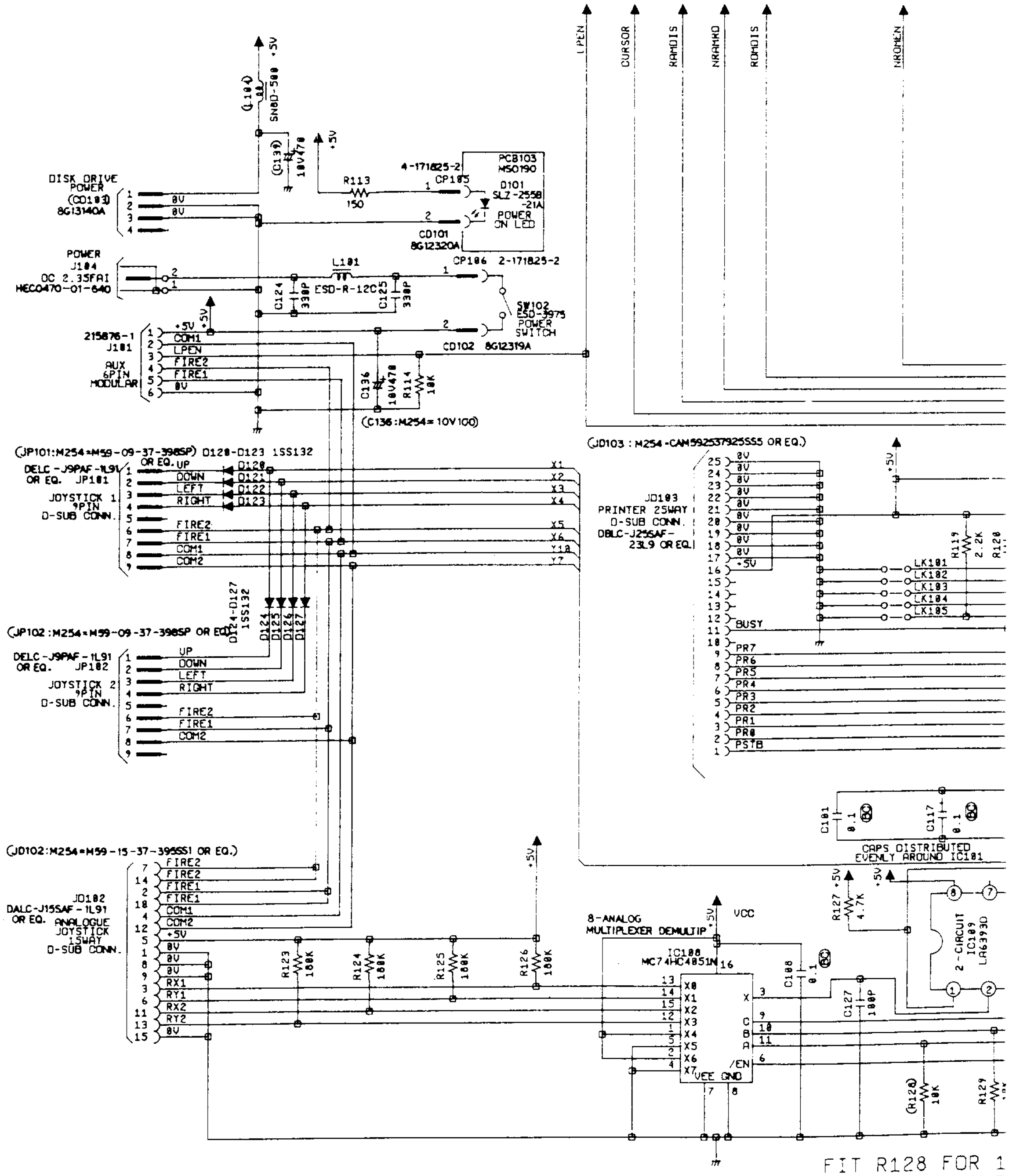
NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS IN THE SCHEMATIC DIAGRAM INDICATES THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

FIT R128 FOR 128K DRAM
FIT R129 FOR DISC VERS
FIT R130 FOR 8-BIT PRINTER

( ) : M245 ONLY

NOTE : R145, X101, C128, C129, L102
IS NOT USE

GATE ARRAY / OUTPUT IN



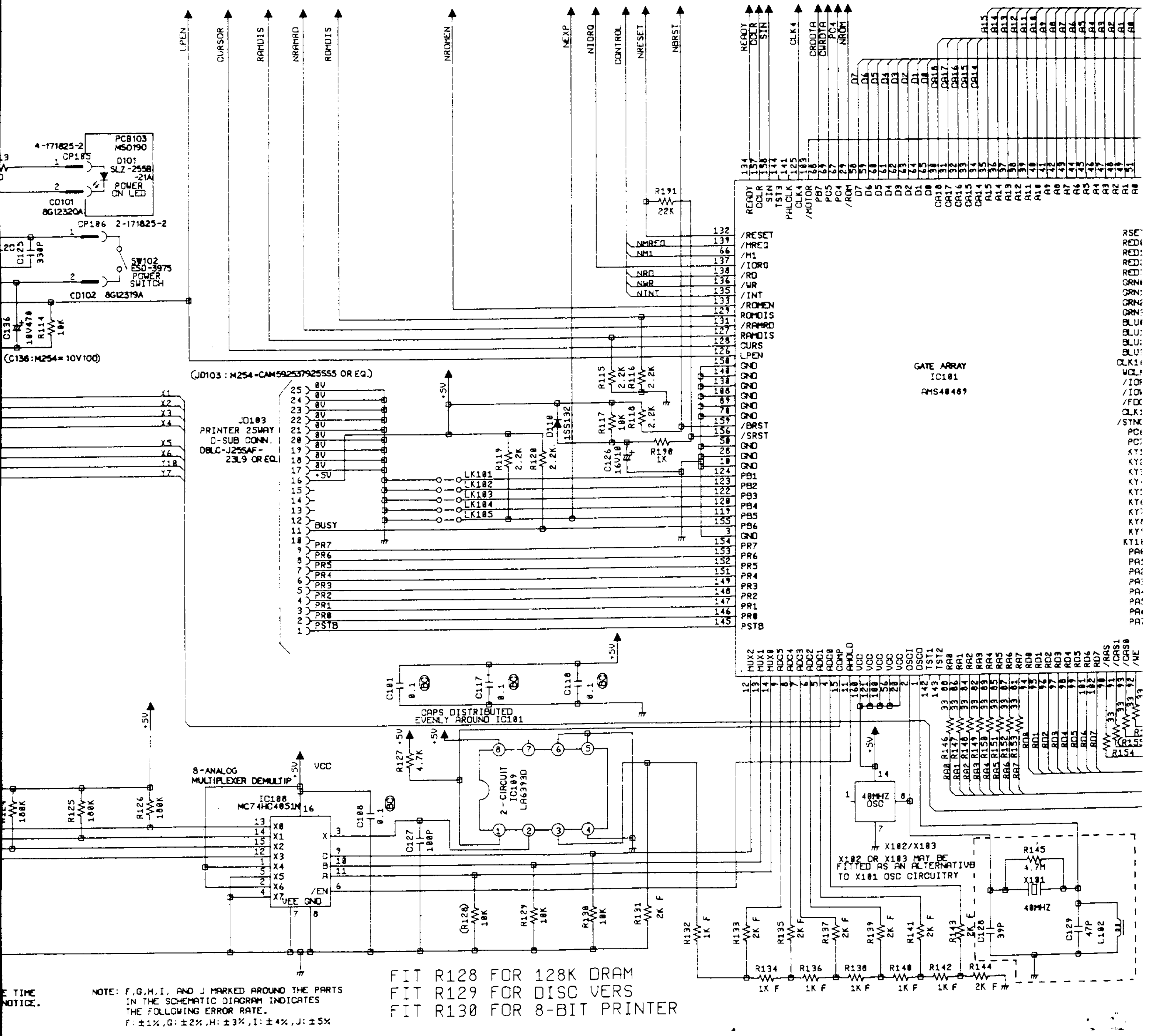
LPEN
CURSOR
RAMDIS
NRAMRD
ROMDIS
NROMEN
+5V
SN8D-500
L104
C139
10V470
R113
150
4-171825-2
CP105
PCB103
MS0190
D101
SLZ-255B-21A
POWER ON LED
CD101
8G12320A
DISK DRIVE POWER
CD103
8G13140A
0V
POWER
J104
DC 2.35FAI
HEC0470-01-640
L101
ESD-R-12C
C124
C125
330P
CP106
2-171825-2
SW102
ESD-3975
POWER SWITCH
CD102
8G12319A
215876-1
J101
AUX 6PIN MODULAR
+5V
COM1
LPEN
FIRE2
FIRE1
C136
R114
10K
(C136:M254=10V100)
(JP101:M254=M59-09-37-398SP) D120-D123 1SS132 OR EQ.
DELC-J9PAF-1L91 OR EQ. JP101
JOYSTICK 1 9PIN D-SUB CONN.
UP
DOWN
LEFT
RIGHT
D120
D121
D122
D123
FIRE2
FIRE1
COM1
COM2
X1
X2
X3
X4
X5
X6
Y10
Y7
D124-D127 1SS132
D124
D125
D126
D127
(JP102:M254=M59-09-37-398SP OR EQ.)
DELC-J9PAF-1L91 OR EQ. JP102
JOYSTICK 2 9PIN D-SUB CONN.
(JD102:M254=M59-15-37-395SS1 OR EQ.)
JD102
DALC-J15SAF-1L91 OR EQ.
ANALOGUE JOYSTICK 15WAY D-SUB CONN.
RX1
RY1
RX2
RY2
R123
R124
R125
R126
100K
(JD103 : M254-CAM592537925SS5 OR EQ.)
JD103
PRINTER 25WAY D-SUB CONN.
DBLC-J25SAF-23L9 OR EQ.
BUSY
PR7
PR6
PR5
PR4
PR3
PR2
PR1
PR0
PSTB
LK101
LK102
LK103
LK104
LK105
R119
2.2K
R120
C101
0.1
C117
CAPS DISTRIBUTED EVENLY AROUND IC101
R127
4.7K
2-CIRCUIT
IC109
LA6393D
8-ANALOG MULTIPLEXER DEMULTIP
VCC
IC108
MC74HC4051N
X0
X1
X2
X3
X4
X5
X6
X7
VEE
GND
/EN
C108
C127
100P
R128
10K
R129

FIT R128 FOR 1
FIT R129 FOR D
FIT R130 FOR 8

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS IN THE SCHEMATIC DIAGRAM INDICATES THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

GATE ARRAY / OUTPUT INTERFACE SCHEMATIC DIAGRAM

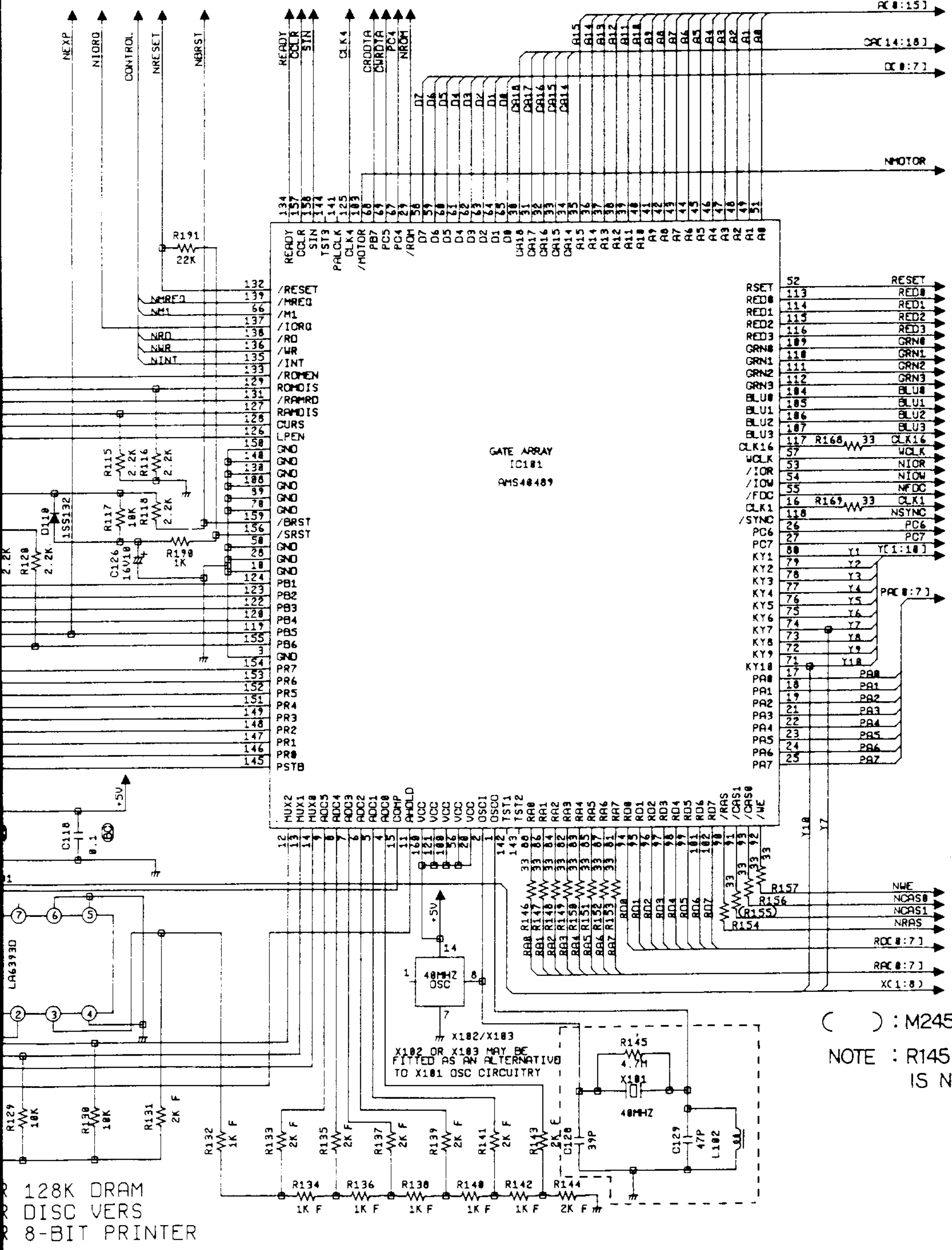

LPEN
CURSOR
RAMDIS
NRAMRD
ROMDIS
NROMEN
NEXP
NIORQ
CONTROL
NRESET
NBRST
READY
CCLR
SIN
CLK4
CRDDTA
CWRDTA
PC4
NROM
PCB103
M50190
4-171825-2
CP105
D101
SLZ-255B
-21A
POWER
ON LED
CD101
8G12320A
CP106 2-171825-2
SW102
ESD-3975
POWER
SWITCH
CD102 8G12319A
C125
330P
C136
10V470
R114
10K
(C136:M254=10V100)
(JD103 : M254-CAM5925379255S5 OR EQ.)
JD103
PRINTER 25WAY
D-SUB CONN.
DBLC-J25SAF-
23L9 OR EQ.
BUSY
PSTB
+5V
LK101
LK102
LK103
LK104
LK105
R115
2.2K
R116
2.2K
R117
10K
R118
2.2K
R119
2.2K
R120
2.2K
D110
1SS132
C126
16V10
R190
1K
R191
22K
GATE ARRAY
IC101
AMS40489
/RESET
/MREQ
/M1
/IORQ
/RD
/WR
/INT
/ROMEN
ROMDIS
/RAMRD
RAMDIS
CURS
LPEN
GND
/BRST
/SRST
PB1
PB2
PB3
PB4
PB5
PB6
PR7
PR6
PR5
PR4
PR3
PR2
PR1
PR0
PSTB
C101
C117
C118
0.1
CAPS DISTRIBUTED
EVENLY AROUND IC101
8-ANALOG
MULTIPLEXER DEMULTIP
IC100
MC74HC4051N
VCC
R124
R125
R126
100K
C100
C127
100P
R127
4.7K
2-CIRCUIT
IC109
LA6393D
R128
R129
R130
10K
R131
2K F
R132
1K F
R133
R135
R137
R139
R141
R143
2K F
R134
R136
R138
R140
R142
1K F
R144
2K F
40MHZ
OSC
X102/X103
X102 OR X103 MAY BE
FITTED AS AN ALTERNATIVE
TO X101 OSC CIRCUITRY
R145
4.7M
X101
40MHZ
C128
39P
C129
47P
L102
MUX2
MUX1
MUX0
ADC5
ADC4
ADC3
ADC2
ADC1
ADC0
COMP
AHOLD
VCC
OSC0
OSC1
TST1
TST2
R146
R147
R148
R149
R150
R151
R152
R153
R154
33

FIT R128 FOR 128K DRAM
FIT R129 FOR DISC VERS
FIT R130 FOR 8-BIT PRINTER

E TIME
NOTICE.

NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS
IN THE SCHEMATIC DIAGRAM INDICATES
THE FOLLOWING ERROR RATE.
F:±1%,G:±2%,H:±3%,I:±4%,J:±5%

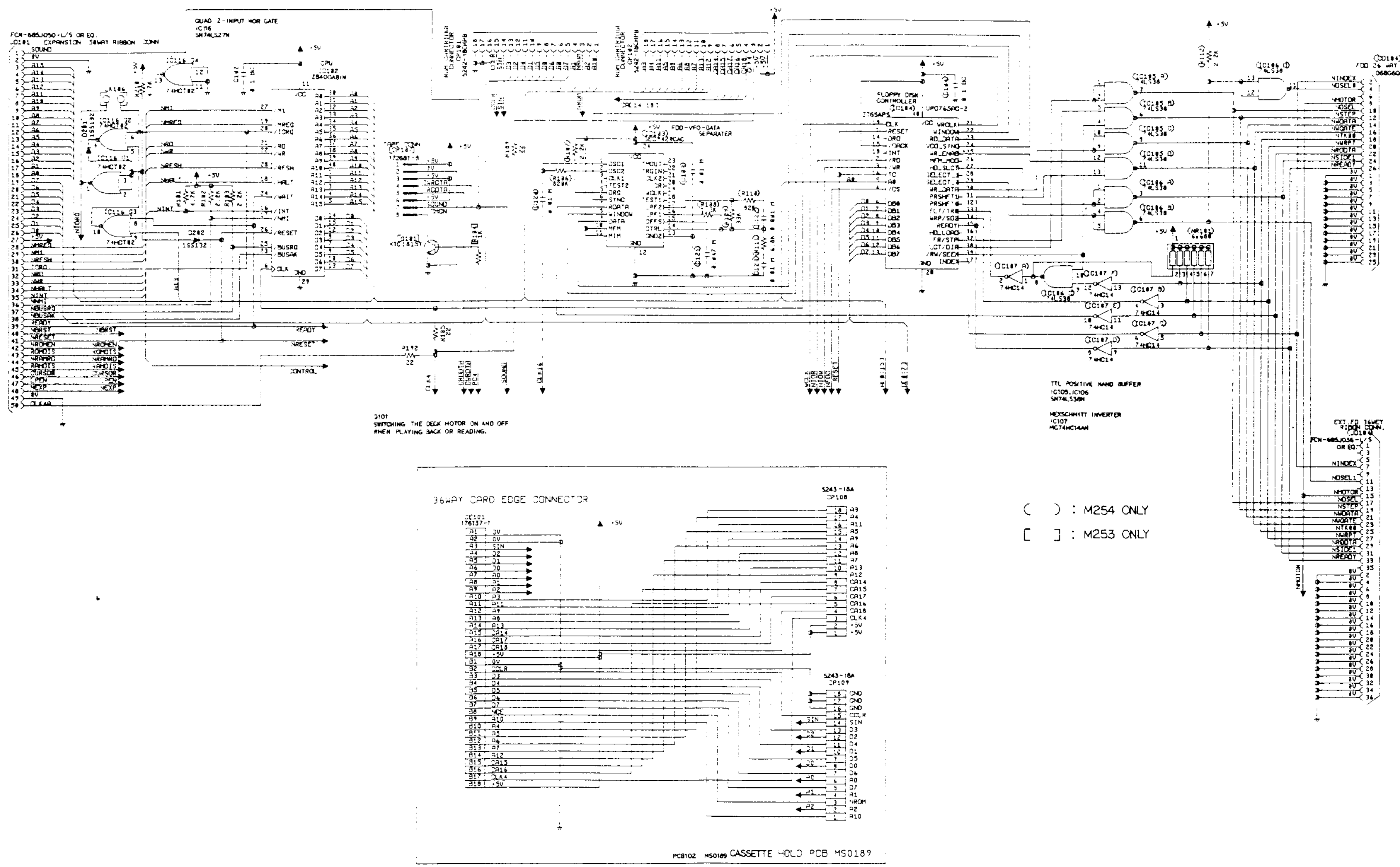
INTERFACE SCHEMATIC DIAGRAM


GATE ARRAY
IC101
AMS40489
NEXP
NIORQ
CONTROL
NRESET
NBRST
READY
CCLR
SIN
CLK4
CRDDTA
CWRDTA
PC4
NROM
A[0:15]
DA[14:18]
D[0:7]
NMOTOR
RESET
RED0
RED1
RED2
RED3
GRN0
GRN1
GRN2
GRN3
BLU0
BLU1
BLU2
BLU3
CLK16
WCLK
NIOR
NIOW
NFDC
CLK1
NSYNC
PC6
PC7
Y[1:10]
PA[0:7]
NWE
NCAS0
NCAS1
NRAS
RD[0:7]
RA[0:7]
X[1:8]
R191
22K
R115
R116
R117
R118
R190
1K
C126
16V10
D110
1SS132
R120
C118
0.1
LA6393D
40MHZ
OSC
X102/X103
X102 OR X103 MAY BE FITTED AS AN ALTERNATIVE TO X101 OSC CIRCUITRY
R145
4.7M
X101
40MHZ
C128
39P
C129
47P
L102
R129
R130
R131
R132
R133
R134
R135
R136
R137
R138
R139
R140
R141
R142
R143
R144
R154
R155
R156
R157
R168
R169
+5V
128K DRAM
DISC VERS
8-BIT PRINTER

( ) : M245 ONLY

NOTE : R145,X101,C128,C129,L102
IS NOT USE

CPU / CONNECTION INTERFACE SCHEMATIC DIAGRAM

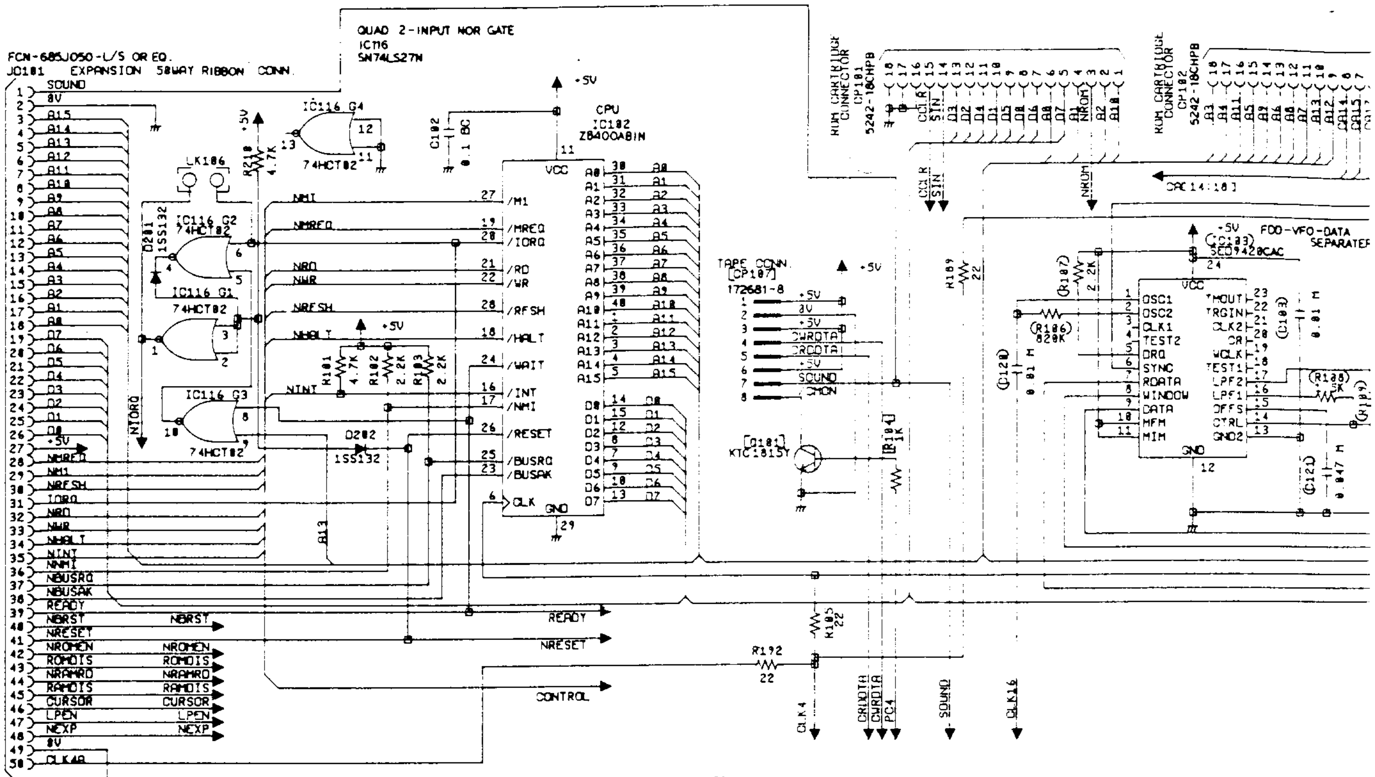

FCN-685J050-L/S OR EQ.
JD101 EXPANSION 50WAY RIBBON CONN
QUAD 2-INPUT NOR GATE
IC116
SN74LS27N
CPU
IC102
Z8400AB1N
74HCT02
ROM CARTRIDGE CONNECTOR
CP101
5242-18CHPB
ROM CARTRIDGE CONNECTOR
CP102
5242-18CHPB
TAPE CONN
CP107
FDD-VFO-DATA SEPARATER
SED9420CAC
FLOPPY DISK CONTROLLER
IC104
Z765APS
UPD765AC-2
TTL POSITIVE NAND BUFFER
IC105, IC106
SN74LS38N
HEXSCHMITT INVERTER
IC107
MC74HC14AN
FDD 26 WAY CONN.
JD104
EXT. FD 36WAY RIBON CONN.
FCN-685J036-L/S OR EQ.
Q101
SWITCHING THE DECK MOTOR ON AND OFF WHEN PLAYING BACK OR READING.
36WAY CARD EDGE CONNECTOR
IC101
176137-1
5243-18A
CP108
5243-18A
CP109
PCB102 MS0189 CASSETTE HOLD PCB MS0189
CONTROL
SOUND
CLK4
CLK16
NMOTOR

( ) : M254 ONLY

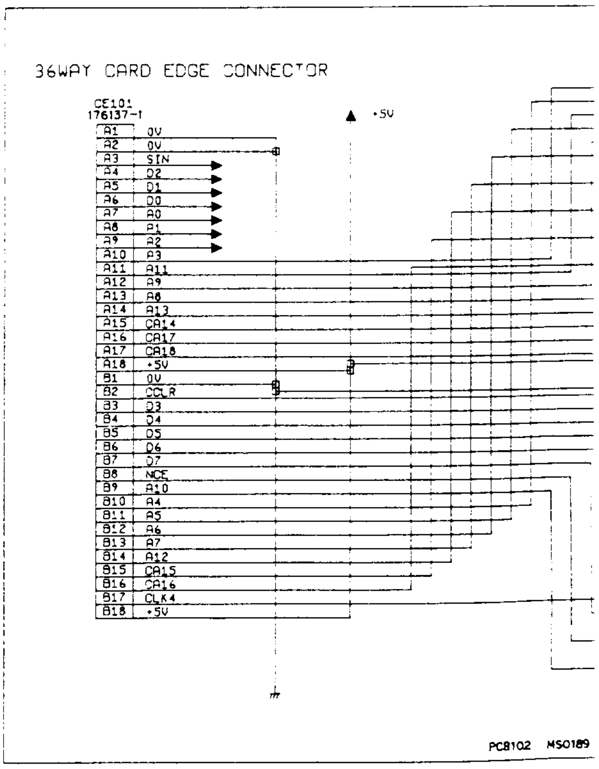
[ ] : M253 ONLY

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CPU / CONNECTION INTERFA

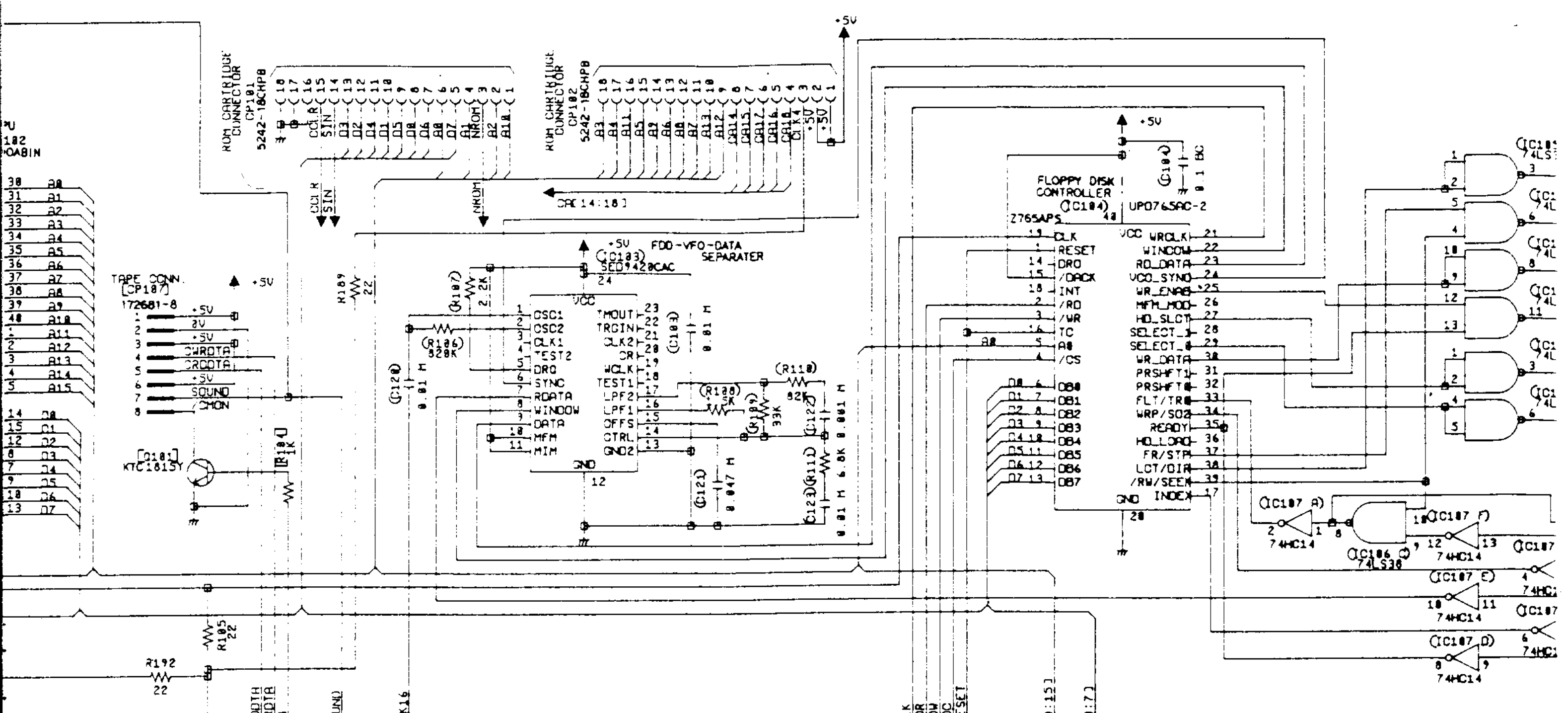

FCN-685J050-L/S OR EQ.
JD101 EXPANSION 50WAY RIBBON CONN.
SOUND
0V
A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
D7
D6
D5
D4
D3
D2
D1
D0
+5V
NMREQ
NM1
NRFSH
IORQ
NRD
NWR
NHALT
NINT
NNMI
NBUSRQ
NBUSAK
READY
NBRST
NRESET
NROMEN
ROMDIS
NRAMRD
RAMDIS
CURSOR
LPEN
NEXP
0V
CLK4B
QUAD 2-INPUT NOR GATE
IC116
SN74LS27N
IC116 G4
74HCT02
IC116 G2
74HCT02
IC116 G1
74HCT02
IC116 G3
74HCT02
LK106
D201
1SS132
R210
4.7K
NIORQ
CPU
IC102
Z8400ABIN
C102
0.1 BC
+5V
VCC
/M1
/MREQ
/IORQ
/RD
/WR
/RFSH
/HALT
/WAIT
/INT
/NMI
/RESET
/BUSRQ
/BUSAK
CLK
GND
R101
4.7K
R102
2.2K
R103
2.2K
D202
1SS132
R13
NBRST
NROMEN
ROMDIS
NRAMRD
RAMDIS
CURSOR
LPEN
NEXP
READY
NRESET
CONTROL
TAPE CONN.
[CP107]
172681-8
+5V
0V
+5V
CWRDTA
CRDDTA
+5V
SOUND
CMON
[Q101]
KTC1815Y
[R104]
1K
R109
22
R105
22
R192
22
CLK4
CRDDTA
CWRDTA
PC4
SOUND
CLK16
ROM CARTRIDGE CONNECTOR
CP101
5242-18CHPB
ROM CARTRIDGE CONNECTOR
CP102
5242-18CHPB
CCLR
SIN
NROM
CA[14:18]
FDD-VFO-DATA SEPARATER
SED9420CAC
(C103)
(R107)
2.2K
(R106)
820K
(C120)
0.01 M
(C121)
0.047 M
(R108)
OSC1
OSC2
CLK1
TEST2
DRQ
SYNC
RDATA
WINDOW
DATA
MFM
MIM
GND
TMOUT
TRGIN
CLK2
CR
WCLK
TEST1
LPF2
LPF1
OFFS
CTRL
GND2

Q101
SWITCHING THE DECK MOTOR ON AND OFF
WHEN PLAYING BACK OR READING.


36WAY CARD EDGE CONNECTOR
CE101
176137-1
+5V
A1 0V
A2 0V
A3 SIN
A4 D2
A5 D1
A6 D0
A7 A0
A8 A1
A9 A2
A10 A3
A11 A11
A12 A9
A13 A8
A14 A13
A15 CA14
A16 CA17
A17 CA18
A18 +5V
B1 0V
B2 CCLR
B3 D3
B4 D4
B5 D5
B6 D6
B7 D7
B8 NCE
B9 A10
B10 A4
B11 A5
B12 A6
B13 A7
B14 A12
B15 CA15
B16 CA16
B17 CLK4
B18 +5V
PC8102 MS0189

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT
OF PRINTING AND SUBJECT TO CHANGE WITHO

CPU / CONNECTION INTERFACE SCHEMATIC DIAGRAM



ROM CARTRIDGE CONNECTOR CP101 5242-18CHPB
ROM CARTRIDGE CONNECTOR CP102 5242-18CHPB
+5V
CCLR
SIN
NROM
CA[14:18]
TAPE CONN. [CP107] 172681-8
+5V
0V
+5V
CWRDTA
CRDDTA
+5V
SOUND
/CMON
[Q101] KTC1815Y
[R104] 1K
R189 22
(R107) 2.2K
(R106) 820K
(C120) 0.01 M
(IC103) SED9420CAC
FDD-VFO-DATA SEPARATER
OSC1
OSC2
CLK1
TEST2
DRQ
SYNC
RDATA
WINDOW
DATA
MFM
MIM
GND
VCC
TMOUT
TRGIN
CLK2
CR
WCLK
TEST1
LPF2
LPF1
OFFS
CTRL
GND2
(C103) 0.01 M
(R108) 5K
(R109) 33K
(R110) 82K
(C122) 0.001 M
(R111) 6.8K
(C121) 0.047 M
(C123) 0.01 M
FLOPPY DISK CONTROLLER (IC104) Z765APS UPD765AC-2
(C104) 0.1 BC
CLK
RESET
DRQ
/DACK
INT
/RD
/WR
TC
A0
/CS
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
GND
VCC
WRCLK
WINDOW
RD_DATA
VCO_SYNC
WR_ENAB
MFM_MOD
HD_SLCT
SELECT_1
SELECT_0
WR_DATA
PRSHFT1
PRSHFT0
FLT/TR0
WRP/SO2
READY
HD_LOAD
FR/STP
LCT/DIR
/RW/SEEK
INDEX
(IC107 A) 74HC14
(IC106 D) 74LS38
(IC107 F) 74HC14
(IC107 E) 74HC14
(IC107 D) 74HC14
(IC105) 74LS38
R105 22
R192 22
CLK4
CRWDTH
CWRDTA
PC4
SOUND
CLK16
WCLK
NTDR
NTDW
NFDC
RESET
A[0:15]
D[0:7]

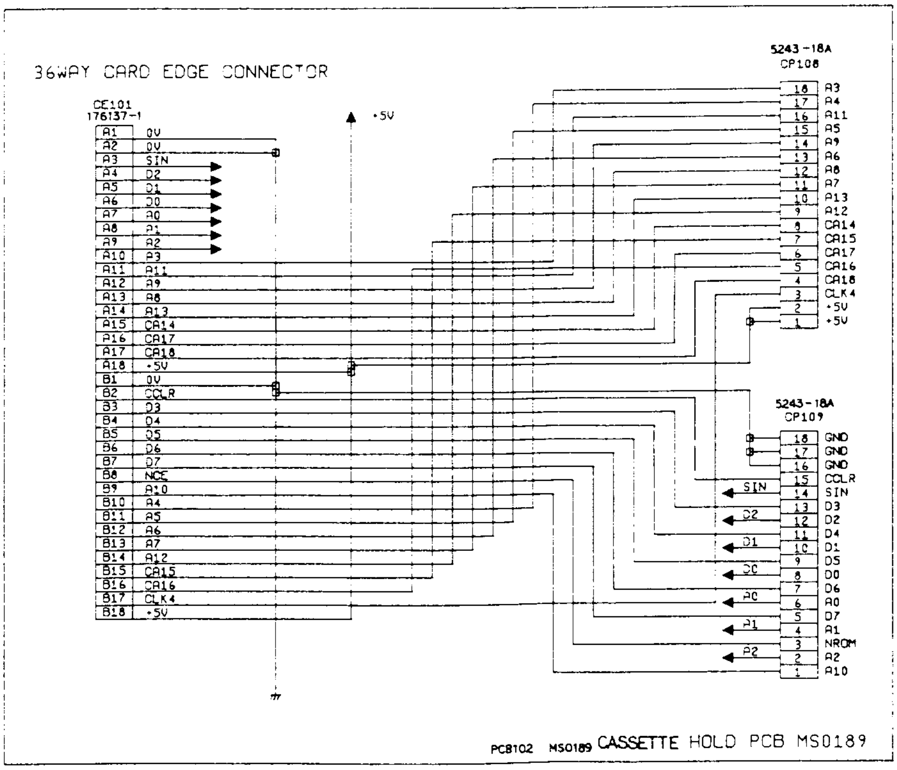
TTL POSITIVE NAND BUFFER
IC105, IC106
SN74LS38N

HEXSCHMITT INVERTER
IC107
MC74HC14AN

Q101
SWITCHING THE DECK MOTOR ON AND OFF
WHEN PLAYING BACK OR READING.

( ) : M254 ONLY

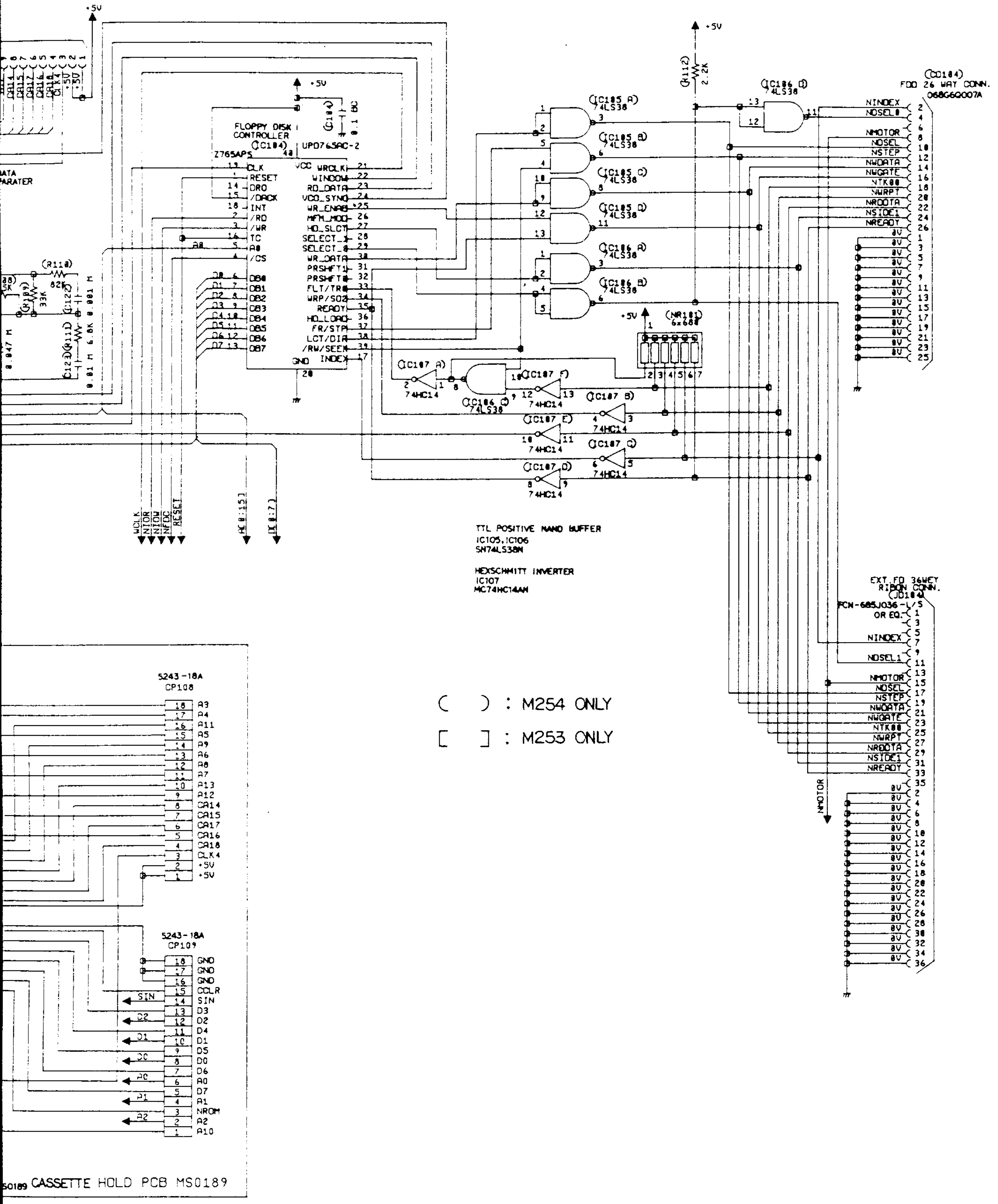
[ ] : M253 ONLY



36WAY CARD EDGE CONNECTOR
CE101 176137-1
5243-18A CP108
5243-18A CP109
+5V
A1 0V
A2 0V
A3 SIN
A4 D2
A5 D1
A6 D0
A7 A0
A8 A1
A9 A2
A10 A3
A11 A11
A12 A9
A13 A8
A14 A13
A15 CA14
A16 CA17
A17 CA18
A18 +5V
B1 0V
B2 CCLR
B3 D3
B4 D4
B5 D5
B6 D6
B7 D7
B8 NCE
B9 A10
B10 A4
B11 A5
B12 A6
B13 A7
B14 A12
B15 CA15
B16 CA16
B17 CLK4
B18 +5V
18 A3
17 A4
16 A11
15 A5
14 A9
13 A6
12 A8
11 A7
10 A13
9 A12
8 CA14
7 CA15
6 CA17
5 CA16
4 CA18
3 CLK4
2 +5V
1 +5V
18 GND
17 GND
16 GND
15 CCLR
14 SIN
13 D3
12 D2
11 D4
10 D1
9 D5
8 D0
7 D6
6 A0
5 D7
4 A1
3 NROM
2 A2
1 A10
PCB102 MS0189 CASSETTE HOLD PCB MS0189

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

FACE SCHEMATIC DIAGRAM



+5V
FLOPPY DISK CONTROLLER
(IC104)
Z765APS
UPD765AC-2
CLK
RESET
DRQ
/DACK
INT
/RD
/WR
TC
A0
/CS
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
VCC
WRCLK
WINDOW
RD_DATA
VCO_SYNC
WR_ENAB
MFM_MOD
HD_SLCT
SELECT_1
SELECT_0
WR_DATA
PRSHFT1
PRSHFT0
FLT/TR0
WRP/SO2
READY
HD_LOAD
FR/STP
LCT/DIR
/RW/SEEK
INDEX
GND
(C104)
0.1 BC
(R110)
82K
(R109)
33K
(C122)
(R111)
6.8K
(C123)
0.047 M
0.01 M
0.001 M
DATA SEPARATER
(R112)
2.2K
(IC105 A) 74LS38
(IC105 B) 74LS38
(IC105 C) 74LS38
(IC105 D) 74LS38
(IC106 A) 74LS38
(IC106 B) 74LS38
(IC106 C) 74LS38
(IC106 D) 74LS38
(IC107 A) 74HC14
(IC107 B) 74HC14
(IC107 C) 74HC14
(IC107 D) 74HC14
(IC107 E) 74HC14
(IC107 F) 74HC14
(NR101) 6x680
(CD104)
FDD 26 WAY CONN.
068G6Q007A
NINDEX
NDSEL0
NMOTOR
NDSEL
NSTEP
NWDATA
NWGATE
NTK00
NWRPT
NRDDTA
NSIDE1
NREADY
0V
EXT. FD 36WAY RIBON CONN.
(JD104)
FCN-685J036-L/S OR EQ.
NDSEL1
WCLK
NIOR
NIOW
NFDC
RESET
A[0:15]
D[0:7]
5243-18A
CP108
A3
A4
A11
A5
A9
A6
A8
A7
A13
A12
CA14
CA15
CA17
CA16
CA18
CLK4
+5V
5243-18A
CP109
GND
CCLR
SIN
D3
D2
D4
D1
D5
D0
D6
A0
D7
A1
NROM
A2
A10
0189 CASSETTE HOLD PCB MS0189

TTL POSITIVE NAND BUFFER
IC105, IC106
SN74LS38N

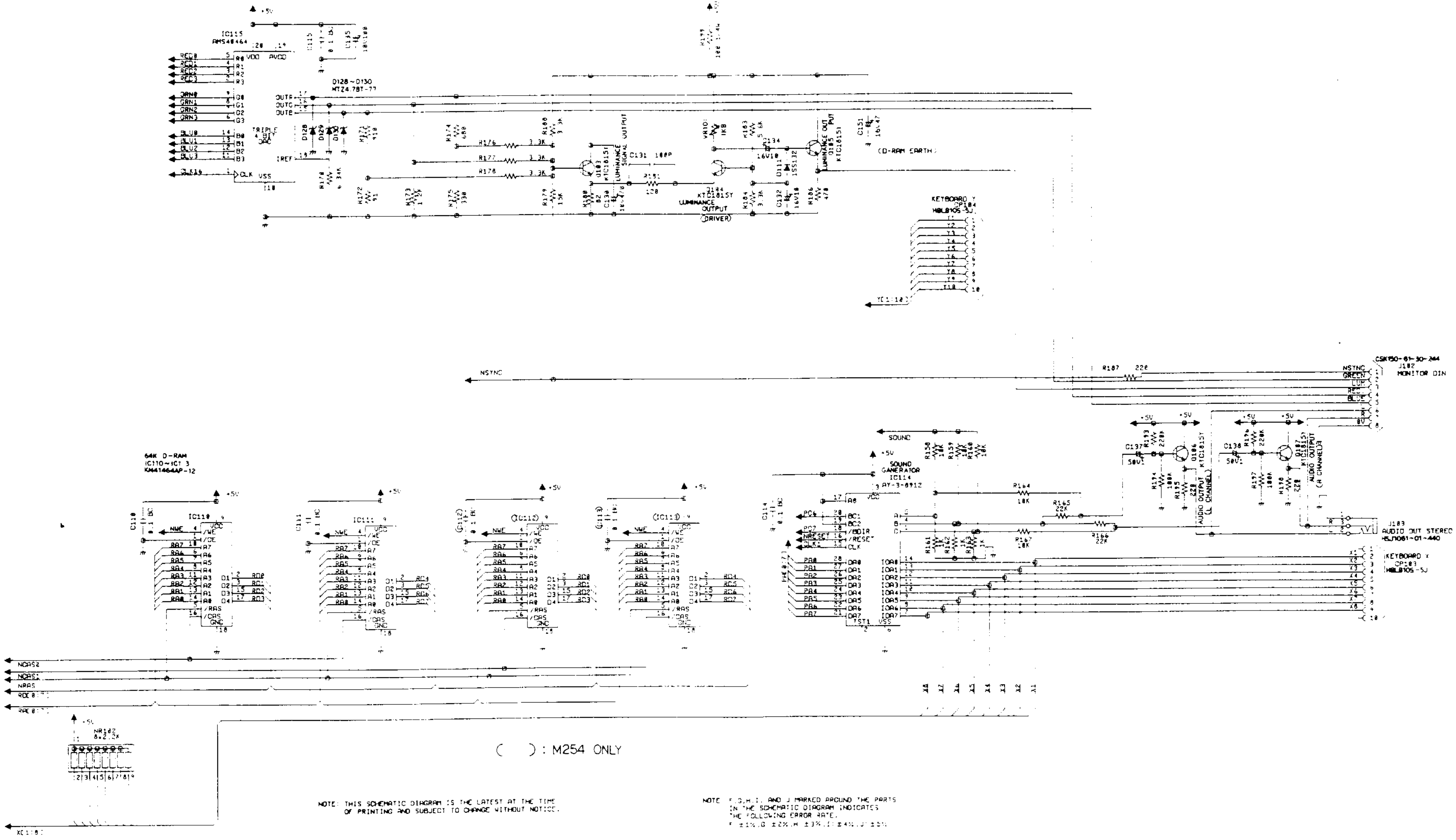
HEXSCHMITT INVERTER
IC107
MC74HC14AN

( ) : M254 ONLY

[ ] : M253 ONLY

ST AT THE TIME
WITHOUT NOTICE.

VIDEO CONVERSION / MEMORY SCHEMATIC DIAGRAM

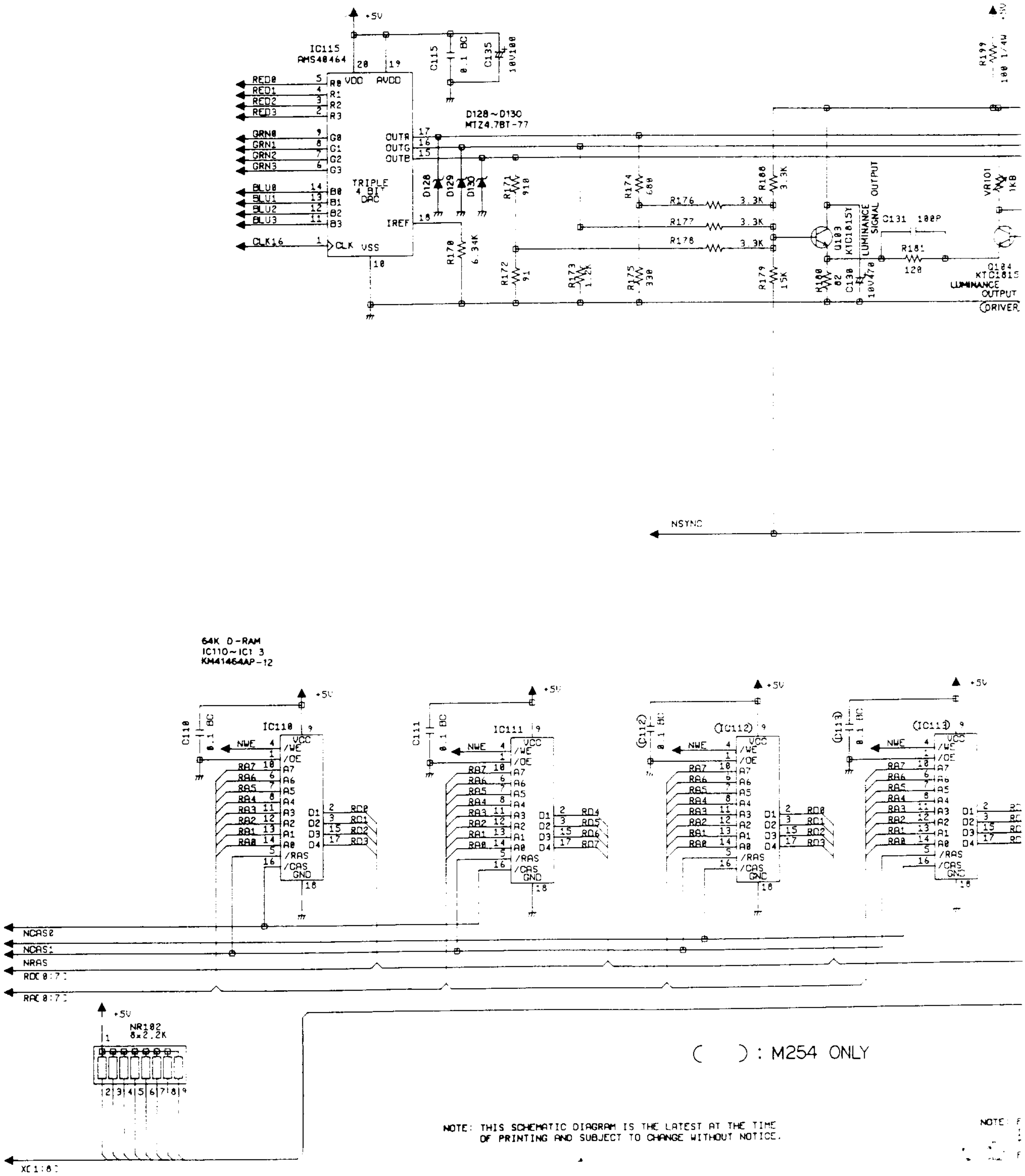

IC115
AMS48464
TRIPLE 4 BIT DAC
D128~D130
MTZ4.7BT-77
LUMINANCE SIGNAL OUTPUT
LUMINANCE OUTPUT (DRIVER)
LUMINANCE OUT PUT
(D-RAM EARTH)
KEYBOARD Y
CP104
HBL8105-5J
NSYNC
CSK150-61-30-244
J102
MONITOR DIN
64K D-RAM
IC110~IC113
KM41464AP-12
IC110
IC111
(IC112)
(IC113)
SOUND
SOUND GENERATOR
IC114
AY-3-8912
AUDIO OUTPUT (L CHANNEL)
AUDIO OUTPUT (R CHANNEL)
J103
AUDIO OUT STEREO
HSJ1061-01-440
KEYBOARD X
CP103
HBL8105-5J
NR102
8×2.2K
NCAS2
NCAS1
NRAS
+5V

( ) : M254 ONLY

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS IN THE SCHEMATIC DIAGRAM INDICATES THE FOLLOWING ERROR RATE.
F ±1%,G ±2%,H ±3%,I ±4%,J ±5%

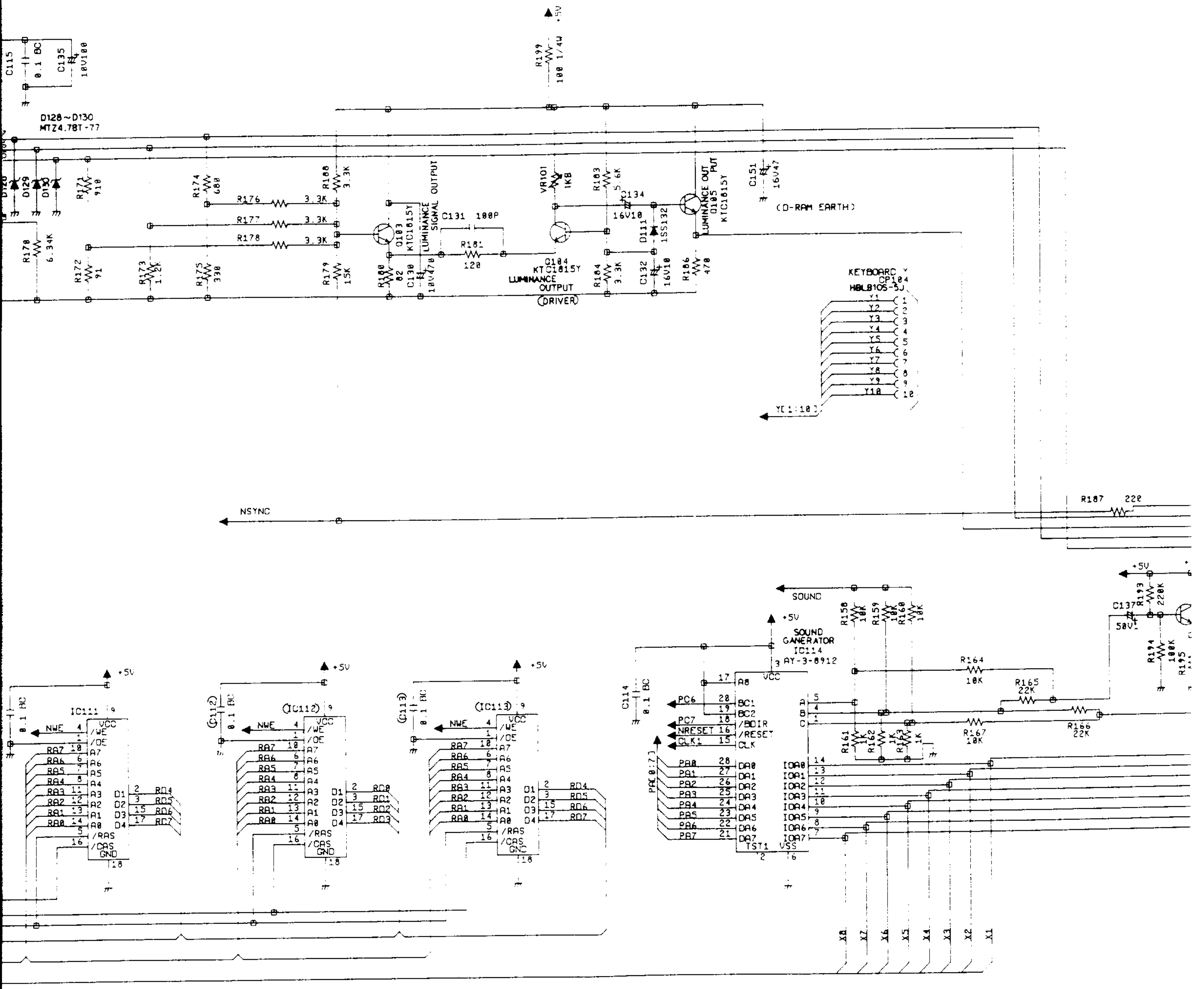
VIDEO CONVERSION /


+5V
IC115
AMS40464
20
19
VDD
AVDD
C115
0.1 BC
C135
10V100
RED0
RED1
RED2
RED3
R0
R1
R2
R3
GRN0
GRN1
GRN2
GRN3
G0
G1
G2
G3
BLU0
BLU1
BLU2
BLU3
B0
B1
B2
B3
CLK16
CLK
VSS
10
TRIPLE
4 BIT
DAC
OUTR
OUTG
OUTB
IREF
17
16
15
18
D128~D130
MTZ4.7BT-77
D128
D129
D130
R170
6.34K
R171
910
R172
91
R173
1.2K
R174
680
R175
330
R176
R177
R178
3.3K
R180
3.3K
R179
15K
R100
82
C130
10V470
Q103
KTC1815Y
LUMINANCE
SIGNAL OUTPUT
C131
100P
R181
120
Q104
KTC1815
LUMINANCE
OUTPUT
DRIVER
R199
100 1/4W
VR101
1K0
NSYNC
64K D-RAM
IC110~IC113
KM41464AP-12
IC110
IC111
(IC112)
(IC113)
C110
C111
(C112)
(C113)
0.1 BC
NWE
/WE
/OE
VCC
A7
A6
A5
A4
A3
A2
A1
A0
RA7
RA6
RA5
RA4
RA3
RA2
RA1
RA0
D1
D2
D3
D4
RD0
RD1
RD2
RD3
RD4
RD5
RD6
RD7
/RAS
/CAS
GND
NCAS0
NCAS1
NRAS
RDC0:7]
RAC0:7]
NR102
8×2.2K
XC1:8]

( ) : M254 ONLY

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

VIDEO CONVERSION / MEMORY SCHEMATIC DIAGRAM



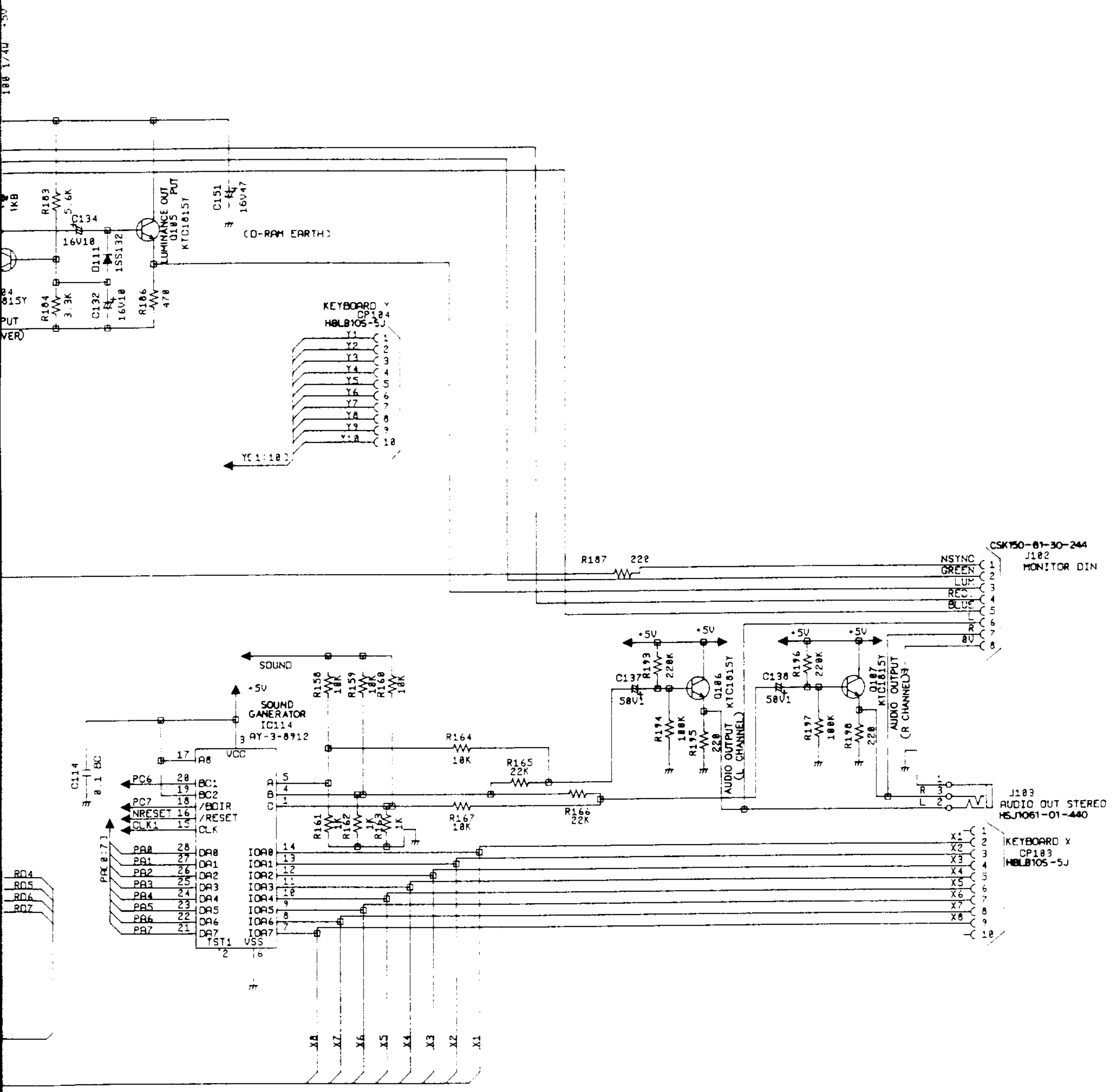
C115
0.1 BC
C135
10V100
R199
100 1/4W
+5V
D128~D130
MTZ4.7BT-77
D129
D130
R171
910
R174
680
R176
3.3K
R177
3.3K
R178
3.3K
R180
3.3K
R170
6.34K
R172
91
R173
1.2K
R175
330
R179
15K
R100
82
C130
10V470
Q103
KTC1815Y
LUMINANCE SIGNAL OUTPUT
C131 100P
R181
120
VR101
1KB
Q104
KTC1815Y
LUMINANCE OUTPUT
(DRIVER)
R183
5.6K
C134
16V10
D111
1SS132
R184
3.3K
C132
16V10
R186
470
Q105
KTC1815Y
LUMINANCE OUTPUT
C151
16V47
(D-RAM EARTH)
KEYBOARD
CP104
HBLB10S-5J
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y[1:10]
NSYNC
R187 22Ω
+5V
C137
50V1
R193
220K
R194
100K
R195
SOUND
R158 10K
R159 10K
R160 10K
SOUND GENERATOR
IC114
AY-3-8912
C114
0.1 BC
R164
10K
R165
22K
R166
22K
R167
10K
R161 1K
R162 1K
R163 1K
PC6
PC7
NRESET
CLK1
PA[0:7]
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
A8
VCC
BC1
BC2
/BDIR
/RESET
CLK
DA0
DA1
DA2
DA3
DA4
DA5
DA6
DA7
TST1
VSS
IOA0
IOA1
IOA2
IOA3
IOA4
IOA5
IOA6
IOA7
A
B
C
X8
X7
X6
X5
X4
X3
X2
X1
IC111
(IC112)
(IC113)
(C112)
(C113)
0.1 BC
NWE
/WE
/OE
RA7
RA6
RA5
RA4
RA3
RA2
RA1
RA0
A7
A6
A5
A4
A3
A2
A1
A0
D1
D2
D3
D4
RD4
RD5
RD6
RD7
RD0
RD1
RD2
RD3
/RAS
/CAS
GND

( ): M254 ONLY

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

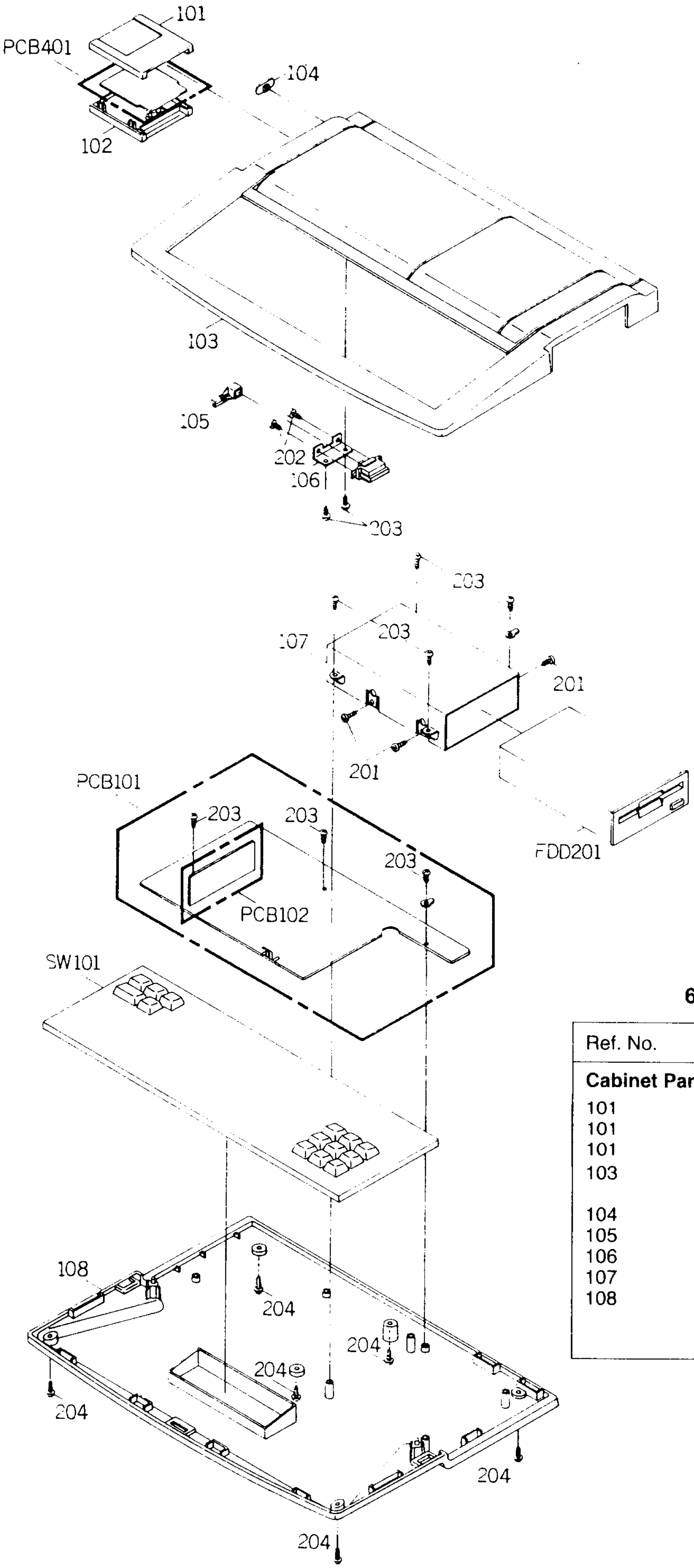
NOTE: F,G,H,I, AND J MARKED AROUND THE PARTS IN THE SCHEMATIC DIAGRAM INDICATES THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

MEMORY SCHEMATIC DIAGRAM


100 1/4W
R183
5.6K
C134
16V10
D111
1SS132
LUMINANCE OUTPUT
Q105
KTC1815Y
C151
16V47
(D-RAM EARTH)
1KB
R184
3.3K
C132
16V10
R186
470
KEYBOARD Y
CP104
HBLB105-5J
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y[1:10]
R187
220
CSK150-01-30-244
J102
MONITOR DIN
NSYNC
GREEN
LUM
RED
BLUE
L
R
0V
SOUND
+5V
SOUND GANERATOR
IC114
AY-3-8912
R158
10K
R159
10K
R160
10K
C114
0.1 BC
PC6
PC7
NRESET
CLK1
PA[0:7]
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
A8
VCC
BC1
BC2
/BDIR
/RESET
CLK
DA0
DA1
DA2
DA3
DA4
DA5
DA6
DA7
TST1
VSS
IOA0
IOA1
IOA2
IOA3
IOA4
IOA5
IOA6
IOA7
A
B
C
R161
1K
R162
1K
R163
1K
R164
10K
R165
22K
R166
22K
R167
10K
C137
50V1
R193
220K
R194
100K
R195
220
Q106
KTC1815Y
AUDIO OUTPUT (L CHANNEL)
C138
50V1
R196
220K
R197
100K
R198
220
Q107
KTC1815Y
AUDIO OUTPUT (R CHANNEL)
J103
AUDIO OUT STEREO
HSJ1061-01-440
KEYBOARD X
CP103
HBLB105-5J
X1
X2
X3
X4
X5
X6
X7
X8
RD4
RD5
RD6
RD7

F,G,H,I, AND J MARKED AROUND THE PARTS
IN THE SCHEMATIC DIAGRAM INDICATES
THE FOLLOWING ERROR RATE.
F: ±1%, G: ±2%, H: ±3%, I: ±4%, J: ±5%

MECHANICAL EXPLODED VIEW


101
PCB401
104
102
103
105
202
106
203
203
107
203
201
201
PCB101
203
203
203
PCB102
FDD201
SW101
108
204
204
204
204
204
204

6128 PLUS CABINET PARTS LIST

Ref. No.	Description	Part No.
Cabinet Parts		
101	Cartridge Assy UK	410891
101	Cartridge Assy France	410901
101	Cartridge Assy Spain	410911
103	Cabinet Top ASSY	270773
	Cabinet Top	
104	Button Power (A)	271618
105	Button Power (B)	271619
106	Bracket Power Switch	271620
107	Frame FDD	271621
108	Cabinet Bottom Assy	270774
	Leg Rubber	
	Sheet Rating	

6128 PLUS ELECTRICAL PARTS LIST

Ref. No.	Description	Part No.
IC's		
IC101	IC AMS40489	40489
IC102	IC Z840GAB1N	40080
IC103	IC SED 9420CAC	171034
IC104	IC Z765APS	40018
IC105, 106	IC SN74LS38N	190056
IC107	IC MC74HC14AN	193024
IC108	IC MC74HC4051N	270752
IC109	IC LA6393D	270997
IC110-113	IC KM41464AP-12	40239
IC114	IC AY-3-8912	40001
IC115	IC AMS40464	40464
IC116	IC PC74HCT02P	170112
Transistor		
Q103-107	TR KTC1815 Y-T	170447
Diodes		
D101	D LED SLZ-255B021A/BT1	170866
D110, 111, 120-127, 201, 202	D 1SS132T-77	171582
D128-130	D MTZ4.7BT-77	175021
Coils and Inductors		
L101	Filter Line ESD-R-12C	270751
L301	Coil Choke SN8D-500	271605
Switches		
SW101	Switch Keyboard ESU44LN027AA (UK)	270779
SW101	Switch Keyboard ESU44LN027DA (Spain)	270795
SW101	Switch Keyboard ESU44CN027CA (France)	270794
SW102	Switch Slide ESD-3975	170002
PCB's		
PCB101	PCB ASSY MC0122	
PCB102	PCB ASSY MS0189	
PCB103	PCB ASSY MS0190	
PCB401	PCB ASSY MC0121	
Miscellaneous		
CFD101	CFD Ansoft 3″ EBFCF2SS1AR5	271610
FDD201	FDD EME-157	271611
NR101	Res. Network EXB-F7E681J	270862
NR102	Res. Network EXB-P88222J	270800
PD001	Paddle 140Z001-40991	270792
X102	Crystal CXO-824C 40MHz	270772
Jacks		
J101	Jack Modular 215876-1	271010
J102	Jack DIN CSK150-81-30-244	271011
J103	Jack RCA 3.5 HSJ1061-01-440	130010
J104	Jack DC HEC0470-01-640	271008
J105	Socket IC DILB40P-8J	176096
Variable Resistors		
VR101	VRSF VG042M102	270753

Ref. No.	Description	Part No.
Resistors: Carbon 1/6W		
1.5 OHM	R108	152140
22 OHM	R105, 189, 192	152156
33 OHM	R146-157, 168, 169	152158
82 OHM	R180	152164
91 OHM	R172	152165
120 OHM	R181	152167
150 OHM	R113	152168
220 OHM	R187, 195, 198	152170
330 OHM	R175	152172
470 OHM	R186	152174
680 OHM	R174, 182	152176
910 OHM	R171	250430
1K OHM	R161-163, 190	152179
1.2K OHM	R173	152180
2.2K OHM	R102, 103, 107, 112, 115, 116, 118-120	152183
3.3K OHM	R176-178, 184, 188	152185
4.7K OHM	R101, 127	152188
5.6K OHM	R183	152189
6.8K OHM	R111	152190
10K OHM	R114, 117, 128-130, 158-160, 164, 167	152194
15K OHM	R179	152196
22K OHM	R165, 166, 191	152198
33K OHM	R109	152200
82K OHM	R110	152207
100K OHM	R194, 197	152209
180K OHM	R123-126	152212
220K OHM	R193, 196	152213
470K OHM	R210	152217
820K OHM	R106	152221
Resistors: Carbon 1/4W		
100 OHM	R199	193588
Resistors: Metal 1/6W		
1K OHM	R132, 134, 136, 138, 140, 142	271025
2K OHM	R131, 133, 135, 137, 139, 141, 143, 144	271026
6.34K OHM	R170	270785
Capacitors: Ceramic		
100PF 50V	C127, 131	24016
330PF 50V	C124, 125	193722
0.1UF 12V	C101, 102, 104, 108, 110, 111-115, 117, 118, 401	175181
Capacitors: Electrolytic		
1UF 50V	C137, 138	157563
10UF 16V	C126, 132, 134	157581
47UF 16V	C151	157629
100UF 10V	C135, 136	193226
470UF 10V	C130, 139	270963
Capacitors: Polyester		
0.001UF 50V	C122	240250
0.01UF 50V	C120, 123, 103	250419
0.047UF 10V	C121	170442

GX4000 TECHNICAL SPECIFICATION

LSI CHIPS
Z80 processor running at 4MHz.
64K RAM.
128K byte ROM cartridge containing "Burnin' Rubber" game.
GI AY-3-8912 3 voice, 8 octave sound generator chip.
Application Specific Integrated Circuit (ASIC) containing 18,000 gates. Includes emulation of 6845 video controller and 8255 parallel peripheral interface. Chip also contains 16,000 bits of storage for sprite data.

ADD-ON ABILITY
1 or 2 digital joysticks or paddles.
IBM Standard analogue joystick. (Some cartridge games).
Light gun.
ROM cartridge up to 512K byte capacity.

DISPLAY SPECIFICATION
16 mode independent sprites are available in 16 different colours from those used to draw the main screen.
Both sprite colours and main screen colours may now be chosen from a palette of 4096. (16 levels of Red, Green and Blue).

Display Mode	Mode 1	Mode 2	Mode 3
No. of colours	4 from 4096	2 from 4096	16 from 4096
No. Sprites	16	16	16
Sprite colours	16 from 4096	16 from 4096	16 from 4096

EXTRA FEATURES
Analogue joystick support.
Soft Scroll allows pixel-wise movement in vertical and horizontal for fast action games.
Split Screen allows two separate areas to be displayed at once alleviating the need to re-draw score bars etc.
DMA driven sound allows tunes to play without processor intervention.
Raster Interrupt allows games to change mode and colours at fixed points on the screen.

EXTERNAL SOCKETS
3.5 mm stereo jack plug for connection to external amplifier.
2 × 9 Pin D-type digital paddle/joystick connectors.
15 Pin D-type analogue joystick connector (IBM Standard).
RJ11 "Telephone" jack for connection of light gun.
Phono socket for UHF TV connection – lead supplied.
8 Pin DIN socket for RGB, sync, Luminance and stereo sound connection to monitor.
21 Pin Scart/Peritel socket for direct connection to TV.
6 mm socket for connection of 5V power supply from monitor*.
6 mm socket for connection of AC adaptor (AC adaptor supplied).

* GX4000 can be connected to MM12 or CM14 monitor and powered from the monitor.

DIMENSIONS mm (approx.)

	Width	Height	Depth
GX4000	**250**	**44**	**184**

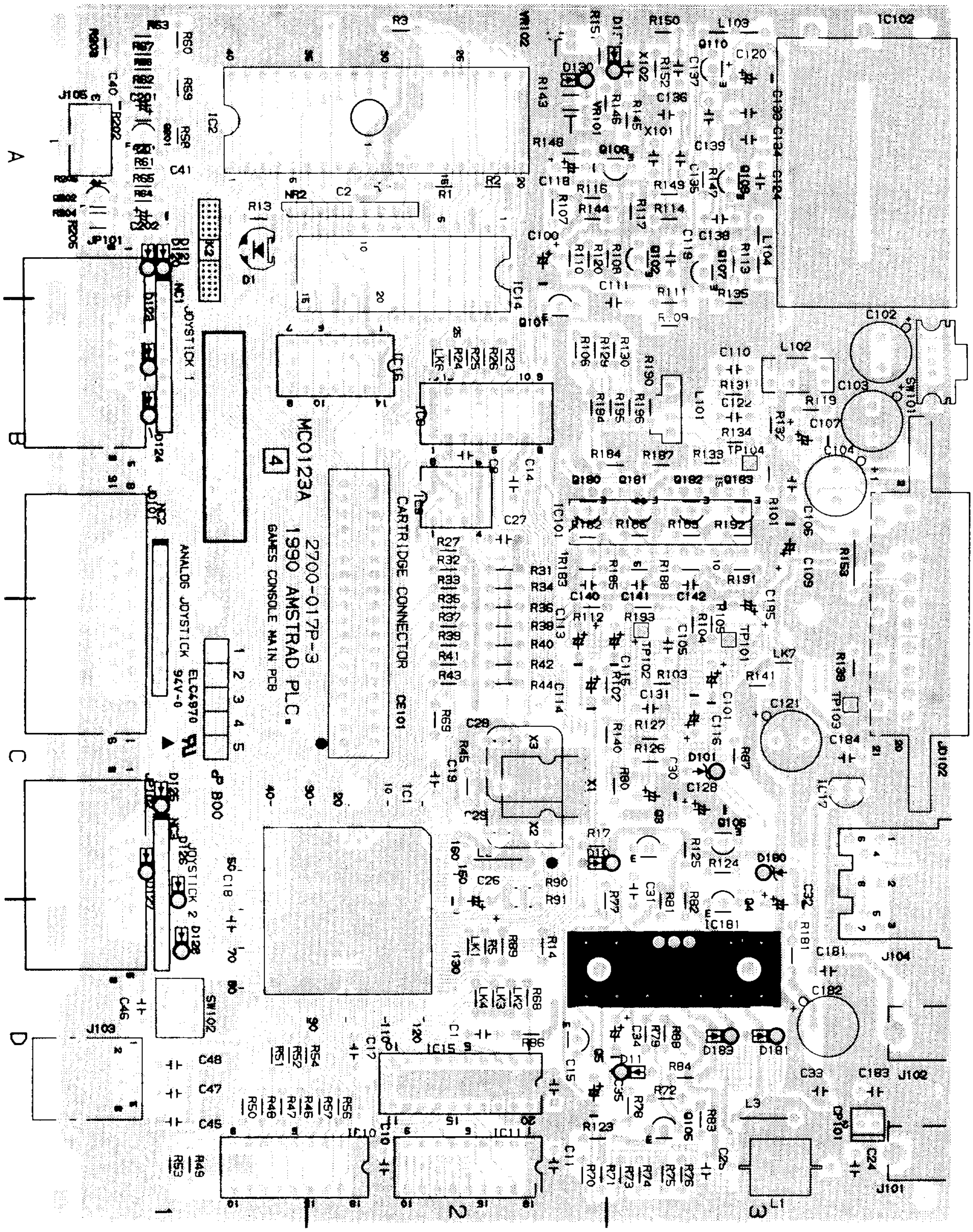
POWER SUPPLY
GX4000 PSU AC adaptor 220V (EURO) 240V (UK) 50 Hz.

ELECTRICAL ADJUSTMENT

FREQUNECY

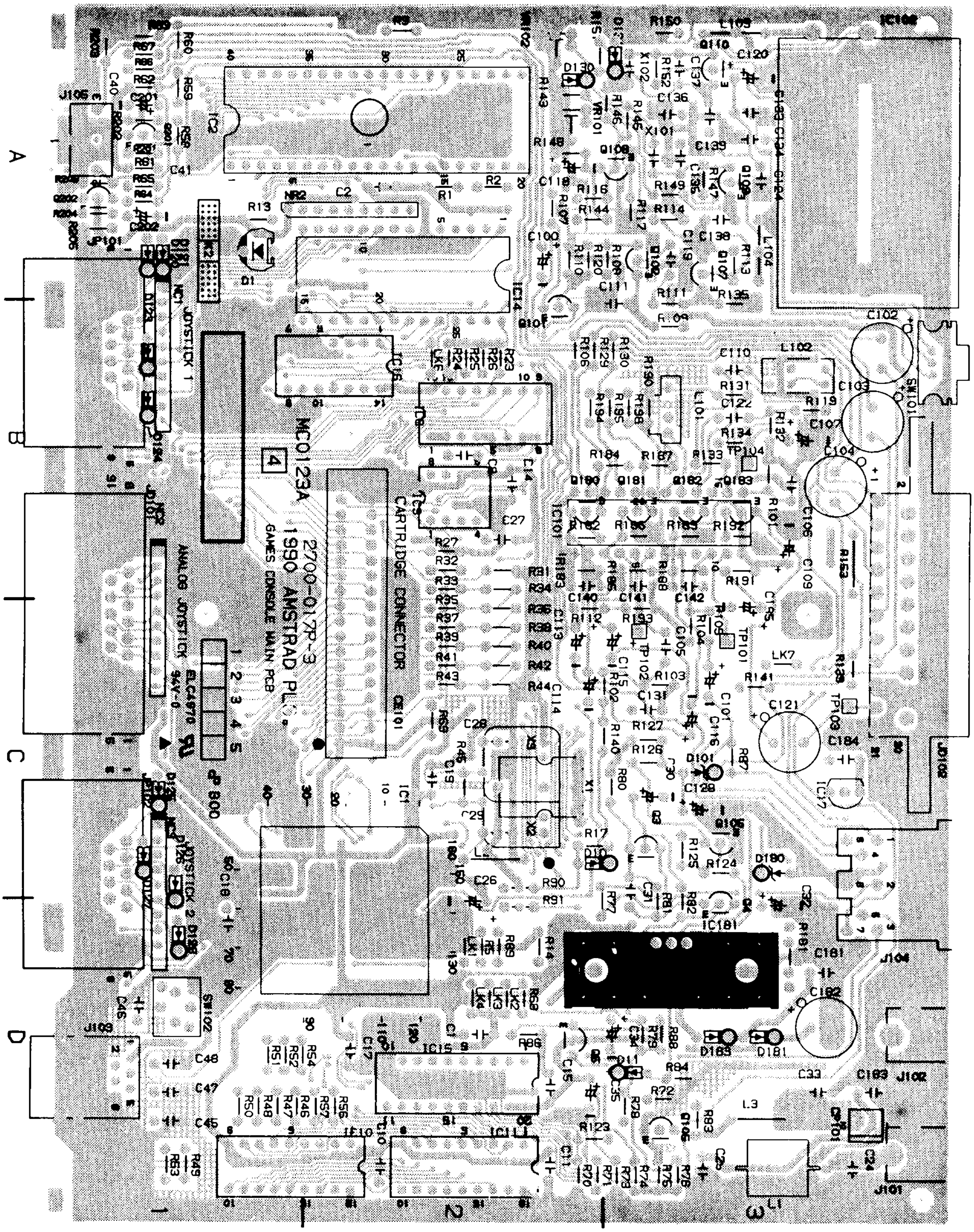
1. Connect the set to a normal TV set with the RF cable.
2. Insert the cartridge into the set.
3. Adjust the coil in the RF modulator of set so that letters are shown in the picture.

MAIN P.C.B. (Top View)

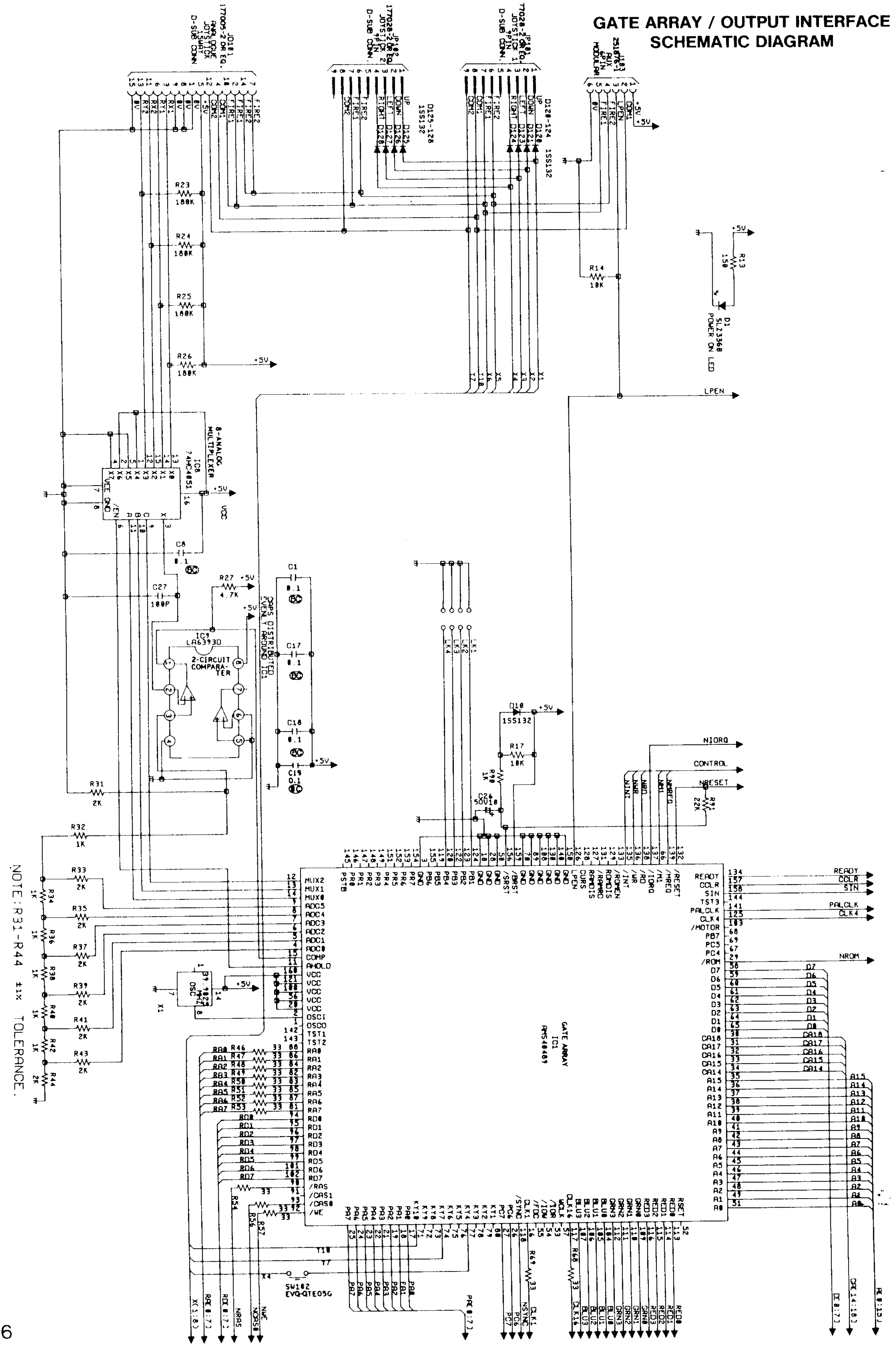


A
B
C
D
1
2
3
MC0123A
2700-017P-3
1990 AMSTRAD PLC.
GAMES CONSOLE MAIN PCB
CARTRIDGE CONNECTOR
CE101
JOYSTICK 1
JOYSTICK 2
ANALOG JOYSTICK
ELC4970
94V-0
dP BOO
IC1
IC2
IC8
IC10
IC11
IC14
IC15
IC16
IC101
IC102
IC181
J101
J102
J103
J104
J105
JD101
JD102
JP101
SW101
SW102
VR101
VR102
X1
X2
X3
X101
X102
L1
L3
L101
L102
L103
L104
TP101
TP102
TP103
TP104
LK1
LK2
LK3
LK4
LK6
LK7

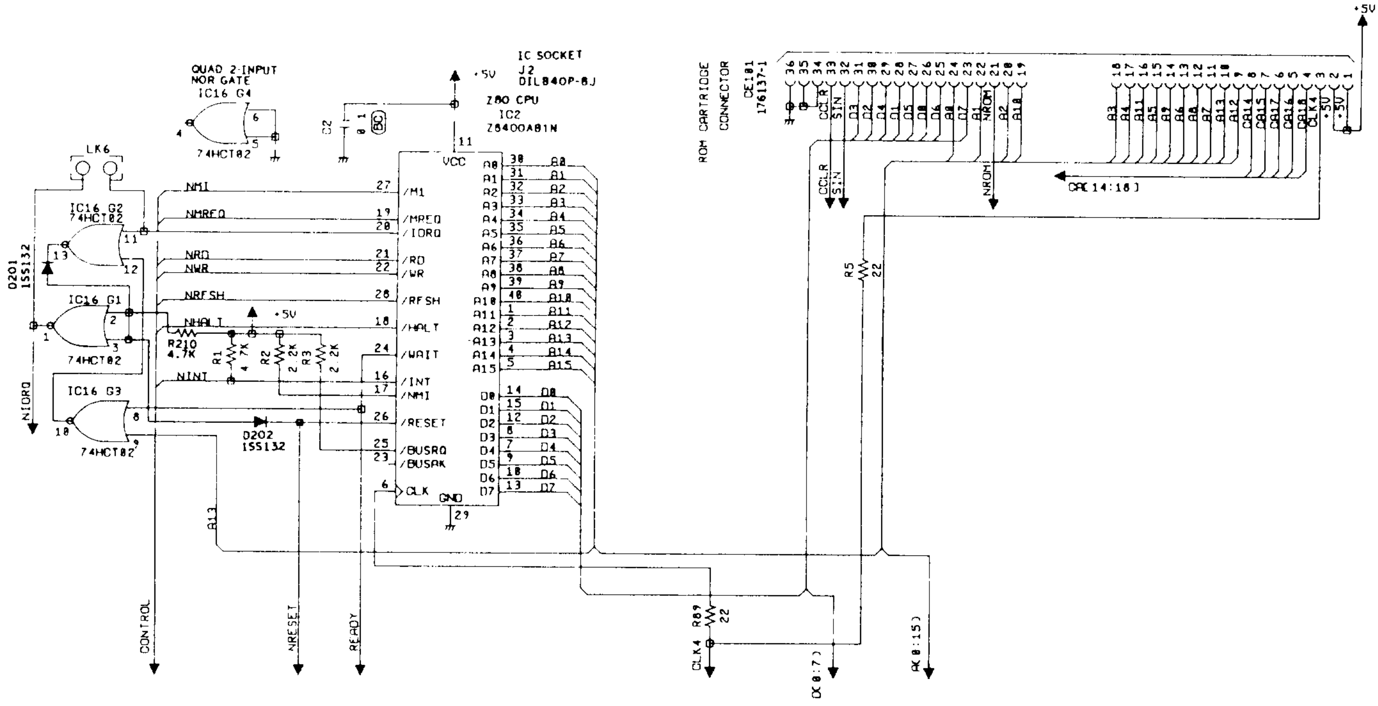
BOTTOM


A
B
C
D
1
2
3
MC0123A
2700-017P-3
1990 AMSTRAD PLC
GAMES CONSOLE MAIN PCB
CARTRIDGE CONNECTOR
ANALOG JOYSTICK
JOYSTICK 1
JOYSTICK 2
IC1
IC2
IC14
IC101
IC102
IC181
J101
J102
J103
J104
J105
SW101
SW102
L1
L3
TP101
TP102
TP104
X1
X2
X3

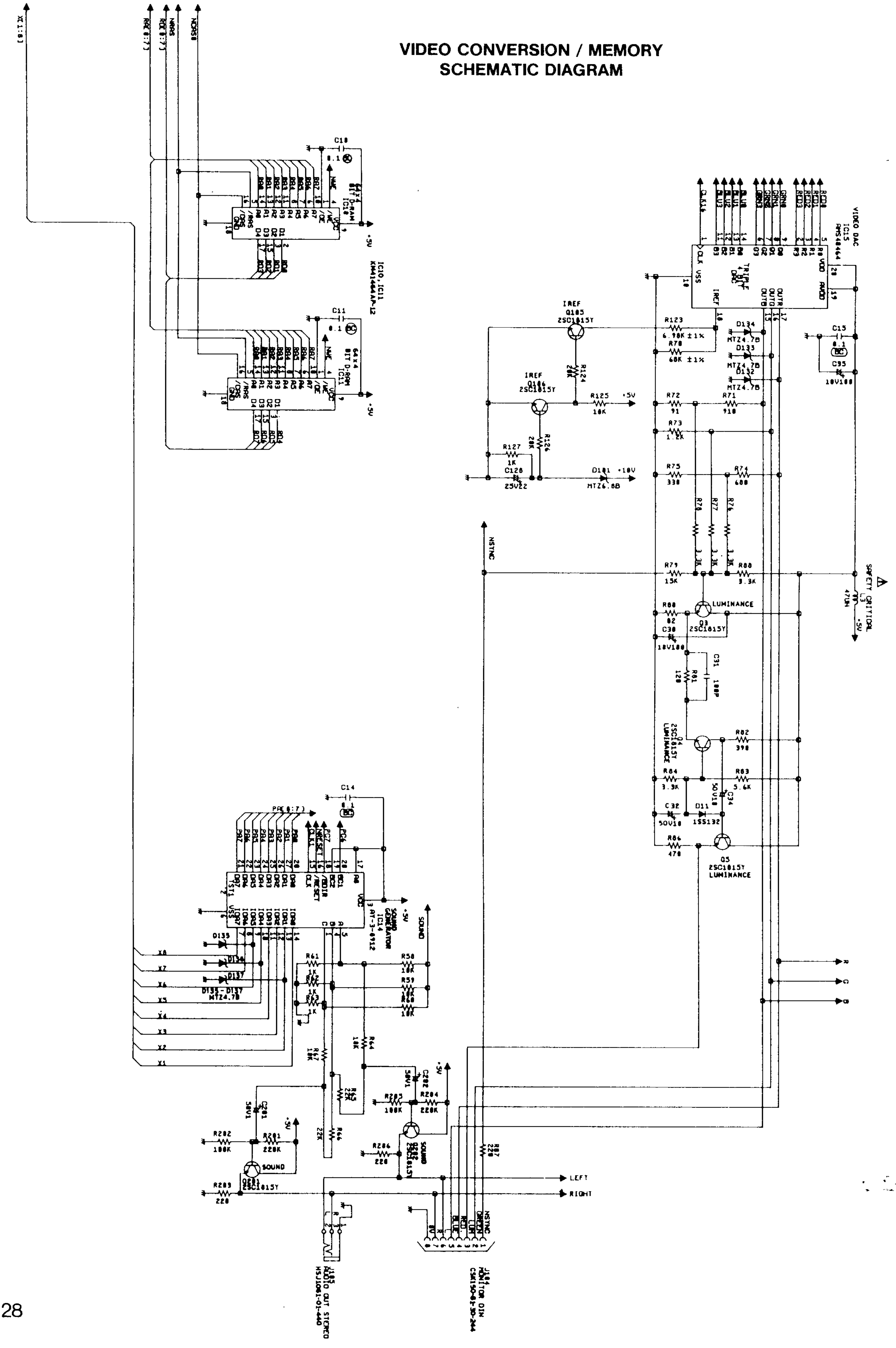
GATE ARRAY / OUTPUT INTERFACE SCHEMATIC DIAGRAM


JD101 177005-2 OR EQ. ANALOGUE JOYSTICK 15PIN D-SUB CONN.
JP102 177020-2 OR EQ. JOYSTICK 2 9PIN D-SUB CONN.
JP101 177020-2 OR EQ. JOYSTICK 1 9PIN D-SUB CONN.
J103 Z5106-1 AUX 6PIN MODULAR
D125-128 1SS132
D120-124 1SS132
R23 100K
R24 100K
R25 100K
R26 100K
R14 10K
R13 150
D1 SLZ3360 POWER ON LED
LPEN
IC8 74HC4051 8-ANALOG MULTIPLEXER
C8 0.1
C27 100P
R27 4.7K
IC9 LA6393D 2-CIRCUIT COMPARATER
CAPS DISTRIBUTED EVENLY AROUND IC1
C1 0.1
C17 0.1
C18 0.1
C19 0.1
LK1
LK2
LK3
LK4
D10 1SS132
R17 10K
R90 1K
C26 50V10
NIORQ
CONTROL
NRESET
R91 22K
R31 2K
R32 1K
R33 2K
R34 1K
R35 2K
R36 1K
R37 2K
R38 1K
R39 2K
R40 1K
R41 2K
R42 1K
R43 2K
R44 2K
X1 31.9872 MHZ OSC
GATE ARRAY IC1 AMS40489
READY
CCLR
SIN
PALCLK
CLK4
NROM
D[0:7]
CA[14:18]
A[0:15]
R46
R47
R48
R49
R50
R51
R52
R53
R54
R56
R57
R68
R69
SW102 EVQ-QTE05G
X[1:8]
RA[0:7]
RD[0:7]
NRAS
NCAS0
NWE
PA[0:7]
PC7
NSYNC
CLK1
CLK16
BLU3
BLU2
BLU1
BLU0
GRN3
GRN2
GRN1
GRN0
RED3
RED2
RED1
RED0
NOTE: R31-R44 ±1% TOLERANCE.

CPU / CONNECTION INTERFACE
SCHEMATIC DIAGRAM

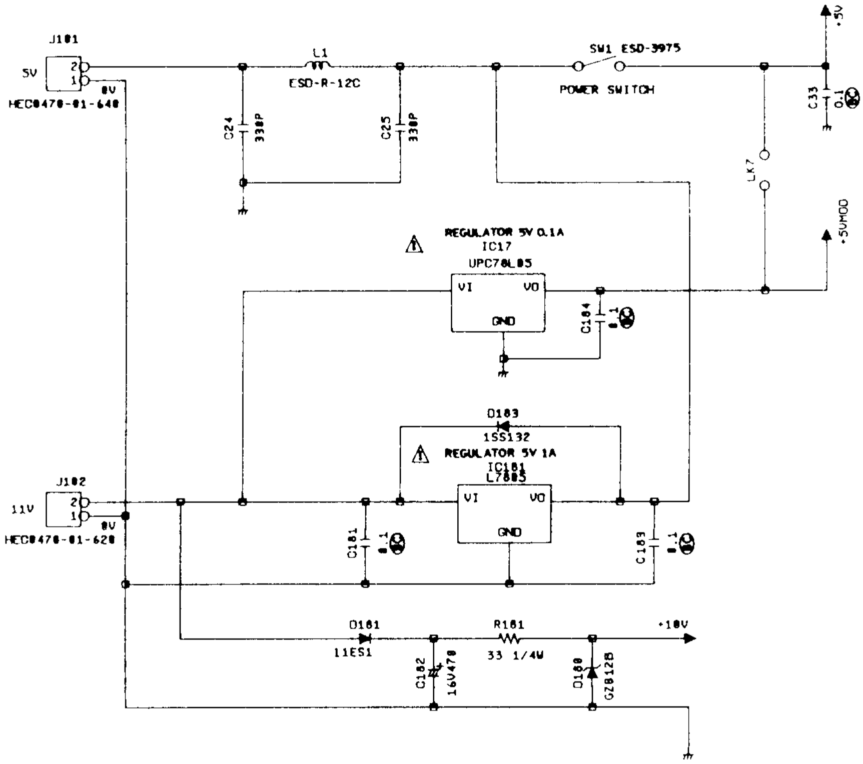

QUAD 2-INPUT NOR GATE
IC16 G4
74HCT02
LK6
IC16 G2
74HCT02
IC16 G1
74HCT02
IC16 G3
74HCT02
D201 1SS132
D202 1SS132
R210 4.7K
R1 4.7K
R2 2.2K
R3 2.2K
+5V
C2 0.1 BC
IC SOCKET
J2
DIL840P-8J
Z80 CPU
IC2
Z8400AB1N
NMI
NMREQ
NRD
NWR
NRFSH
NHALT
NINT
/M1
/MREQ
/IORQ
/RD
/WR
/RFSH
/HALT
/WAIT
/INT
/NMI
/RESET
/BUSRQ
/BUSAK
CLK
VCC
GND
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15
D0 D1 D2 D3 D4 D5 D6 D7
NIORQ
A13
CONTROL
NRESET
READY
ROM CARTRIDGE CONNECTOR
CE101
176137-1
CCLR
SIN
NROM
CA[14:18]
R5 22
R89 22
CLK4
D[0:7]
A[0:15]
DA14 DA15 DA17 DA16 DA18
+5V

VIDEO CONVERSION / MEMORY SCHEMATIC DIAGRAM


XC[1:8]
RAC[0:7]
RDC[0:7]
NRAS
NDRS0
C10
0.1
64Kx4 BIT D-RAM IC10
IC10, IC11 KM41464AP-12
+5V
C11
64Kx4 BIT D-RAM IC11
VIDEO DAC IC15
TRIPLE 4 BIT DAC
RED0 RED1 RED2 RED3
GRN0 GRN1 GRN2 GRN3
BLU0 BLU1 BLU2 BLU3
CLK
VSS
IREF
VDD
AVDD
OUTR
OUTG
OUTB
IREF Q105 2SC1815Y
R123 6.98K ±1%
R70 68K ±1%
D134 MTZ4.7B
D133 MTZ4.7B
D132 MTZ4.7B
C15 0.1
C35 10V100
R124 20K
IREF Q106 2SC1815Y
R125 10K
R126 20K
R127 1K
C120 25V22
D101 +10V MTZ6.8B
R72 91
R71 910
R73 1.2K
R75 330
R74 680
R78 3.3K
R77 3.3K
R76 3.3K
NSYNC
R79 15K
R80 3.3K
SAFETY CRITICAL
L3 47UH
R80 82
LUMINANCE
Q3 2SC1815Y
C30 10V100
C31 100P
R81 120
Q4 2SC1815Y LUMINANCE
R82 390
R84 3.3K
R83 5.6K
C32 50V10
D11 1SS132
C34 50V10
R86 470
Q5 2SC1815Y LUMINANCE
R
G
B
C14 0.1
PA[0:7]
SOUND GENERATOR IC14 AY-3-8912
SOUND
D135
D136
D137
D135-D137 MTZ4.7B
X0 X7 X6 X5 X4 X3 X2 X1
R61 1K
R62 1K
R63 1K
R58 10K
R59 10K
R60 10K
R64 10K
R67 10K
R65 22K
R66 22K
C201 50V1
C202 50V1
R282 100K
R281 220K
R283 220
Q201 2SC1815Y SOUND
R285 100K
R284 220K
R286 220
Q202 2SC1815Y SOUND
R87 220
LEFT
RIGHT
J105 AUDIO OUT STEREO HSJ1001-01-440
J104 MONITOR DIN CSK150-01-30-244

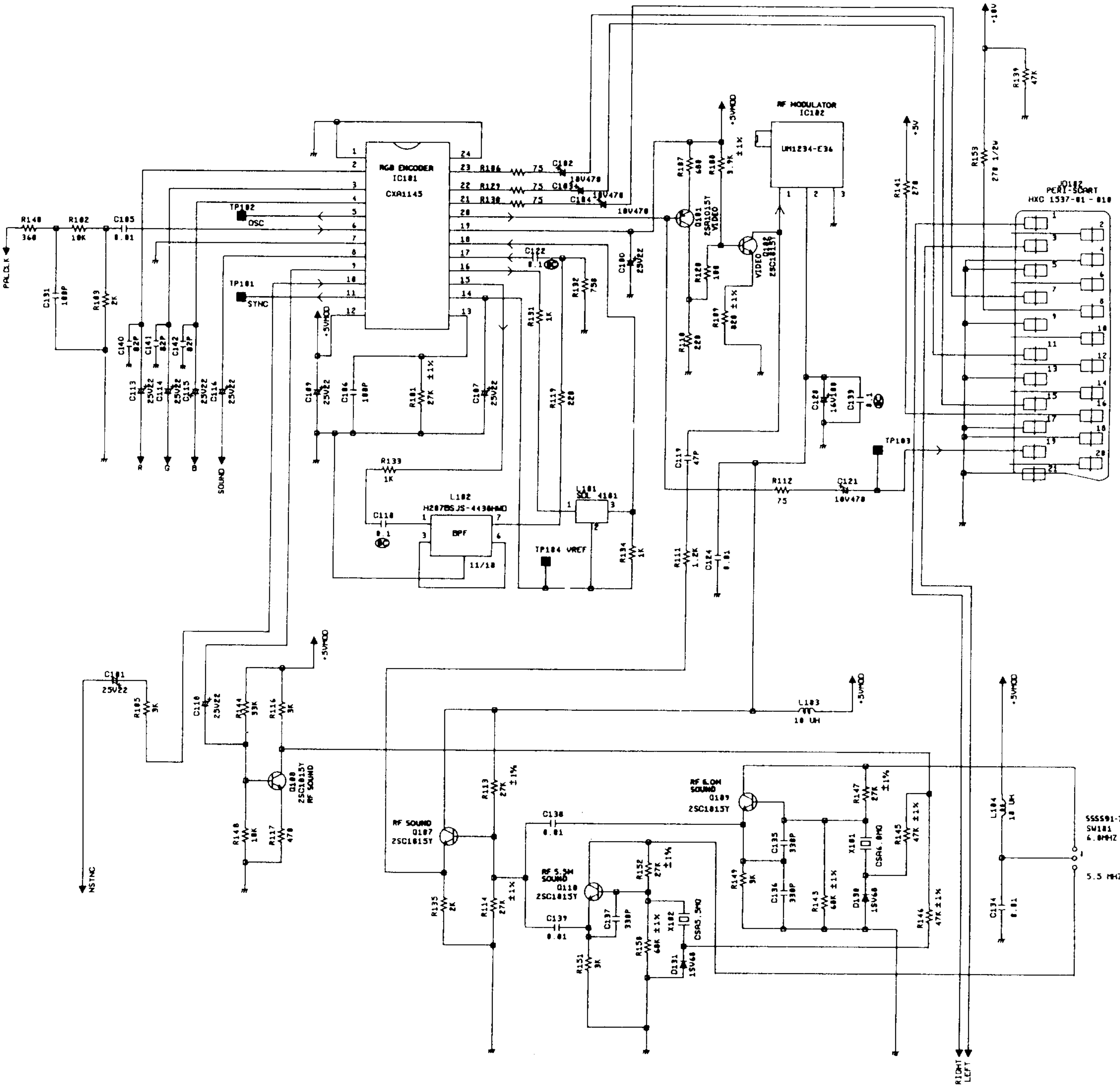
]

POWER REGULATOR SCHEMATIC DIAGRAM

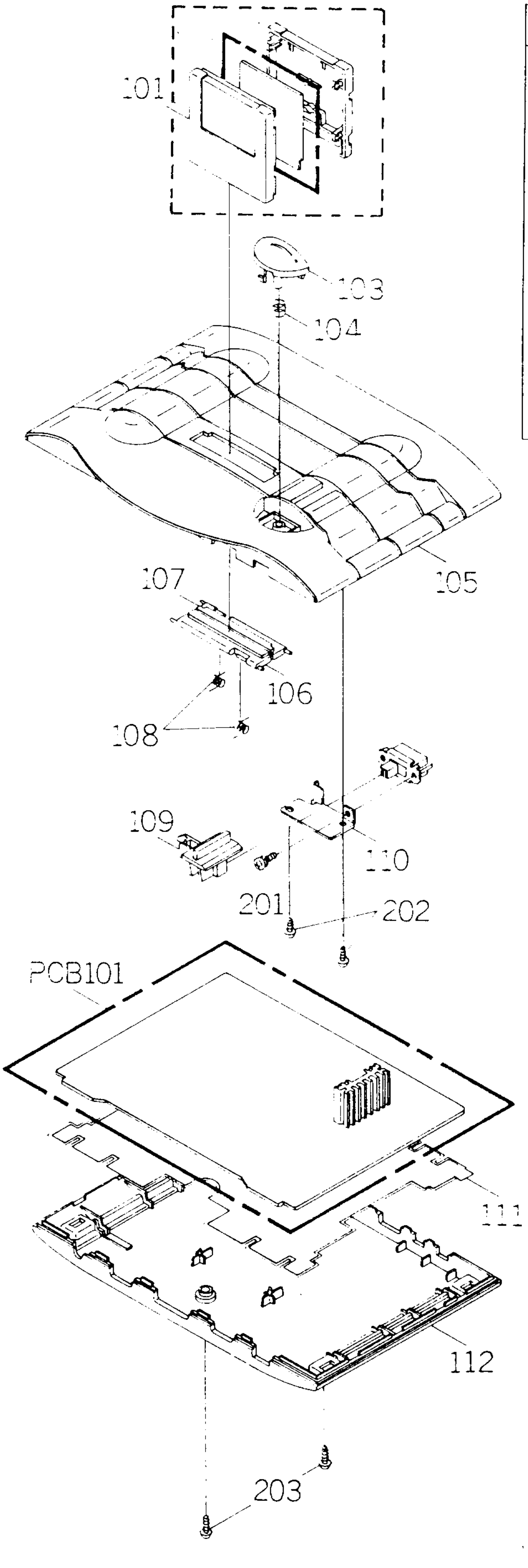

J101
5V
2
1
0V
HEC0470-01-640
L1
ESD-R-12C
C24
330P
C25
330P
SW1 ESD-3975
POWER SWITCH
+5V
C33
0.1
LK7
+5VMOD
REGULATOR 5V 0.1A
IC17
UPC78L05
VI
VO
GND
C104
0.1
D103
1SS132
REGULATOR 5V 1A
IC101
L7805
VI
VO
GND
J102
11V
2
1
0V
HEC0470-01-620
C101
0.1
C103
0.1
D101
11ES1
R101
33 1/4W
+10V
C102
16V470
D100
GZB12B

SCHEMATIC DIAGRAM

RGB CONVERTER


RGB ENCODER
IC101
CXA1145
R140 360
R102 10K
C105 0.01
C131 100P
R103 2K
PALCLK
TP102 OSC
TP101 SYNC
C140 82P
C141 82P
C142 82P
C113 25V22
C114 25V22
C115 25V22
C116 25V22
R
G
B
SOUND
+5VMOD
C109 25V22
C106 100P
R101 27K ±1%
C107 25V22
R106 75
R129 75
R130 75
C102 10V470
C103 10V470
C104 10V470
C122 0.1
C100 25V22
R132 750
R131 1K
R119 220
R133 1K
L102
H207BSJS-4430HMD
BPF
11/10
C118 0.1
L101 SOL 4101
TP104 VREF
R134 1K
RF MODULATOR
IC102
UM1234-E36
+5VMOD
R107 680
R108 3.9K ±1%
Q101 2SA1015Y VIDEO
Q102 2SC1815Y VIDEO
R120 100
R109 820 ±1%
R110 220
C120 16V100
C139 0.1
C119 47P
R111 1.2K
C124 0.01
R112 75
C121 10V470
TP103
+5V
R141 270
+10V
R139 47K
R153 270 1/2W
JO102
PERI-SCART
HXC 1537-01 - 010
C101 25V22
R105 3K
NSYNC
C110 25V22
R144 33K
R116 3K
Q108 2SC1815Y RF SOUND
R148 10K
R117 470
L103 10 UH
RF SOUND
Q107
2SC1815Y
R113 27K ±1%
R135 2K
R114 27K ±1%
C138 0.01
RF 5.5M SOUND
Q110
2SC1815Y
C139 0.01
C137 330P
R152 27K ±1%
R150 68K ±1%
X102 CSA5.5MO
D131 1SV68
R151 3K
RF 6.0M SOUND
Q109
2SC1815Y
R149 3K
C135 330P
C136 330P
R143 68K ±1%
R147 27K ±1%
X101 CSA6.0MO
D130 1SV68
R145 47K ±1%
R146 47K ±1%
L104 10 UH
C134 0.01
SSSS91-749
SW101
6.0MHZ
5.5 MHZ
RIGHT
LEFT

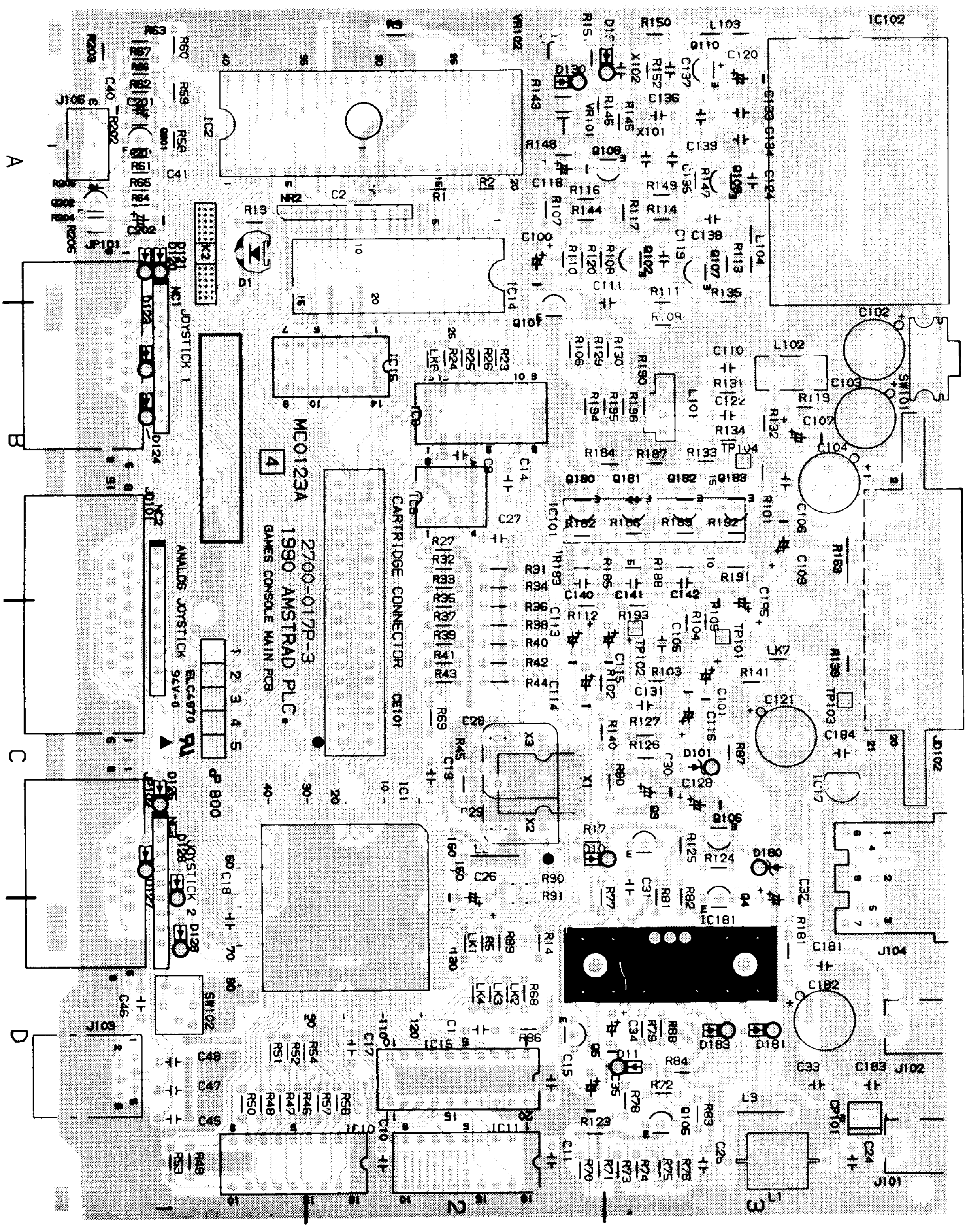
GX4000 CABINET EXPLODED VIEW


101
103
104
105
107
106
108
109
110
201
202
PCB101
111
112
203

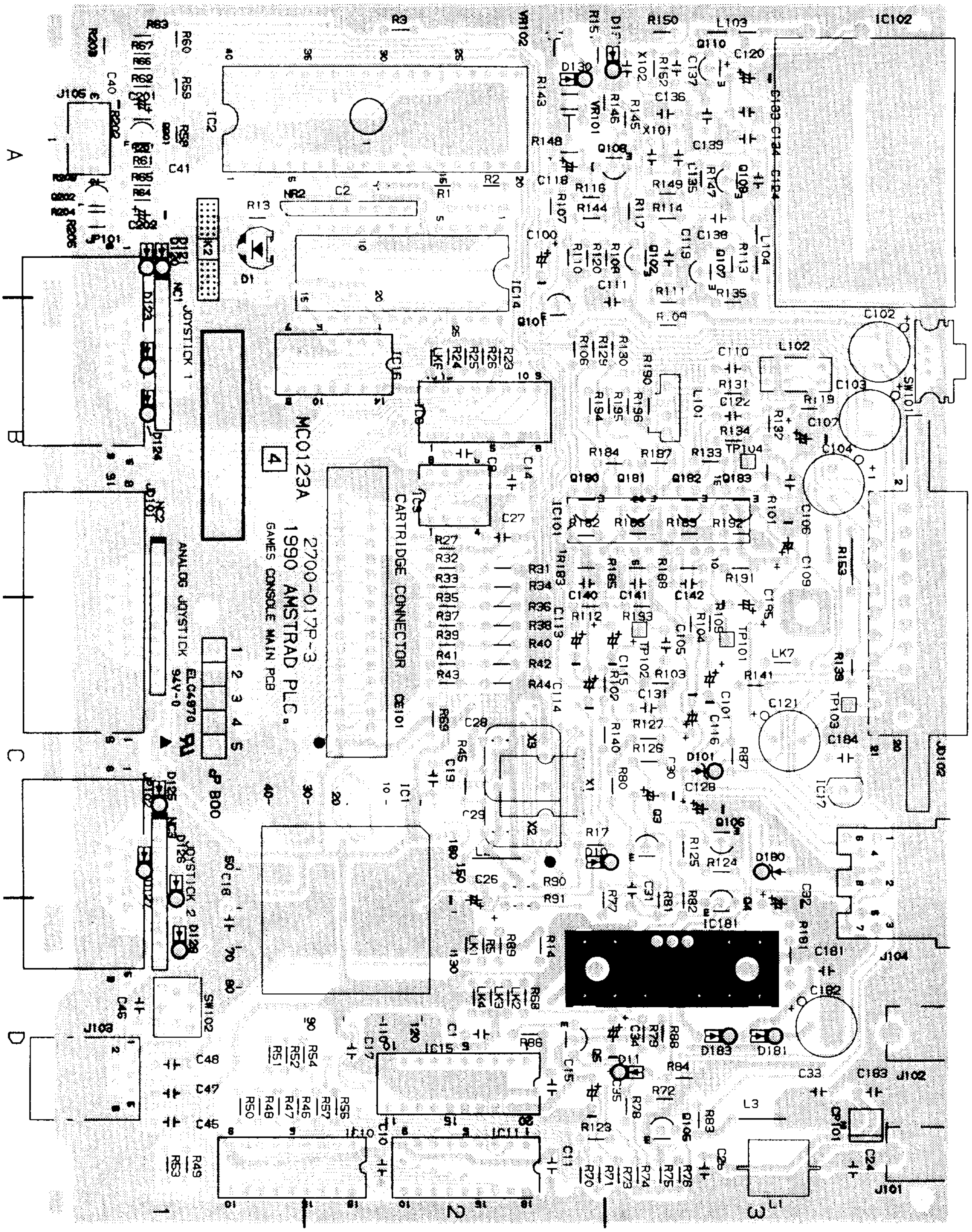
GX4000 CABINET PARTS LIST

Ref. No.	Description	Part No.
Cabinet Parts		
101	Cartridge Case Assy (UK/FR/SP)	41088
103	Knob, Power/Lock	270970
104	Spring Button	271018
105	Top Cabinet Ass'y	270960
	Cabinet Top	
	Glass LED	
	Plate Brand	
106	Flap A	270969
107	Flap B	271000
108	Spring Flap	271019
109	Knob Slide	270966
110	Angle Power Switch	270968
111	Plate Shield	271020
112	Bottom Cabinet	270964
	Label, Rating Plate	270972
	Leg Rubber	270965

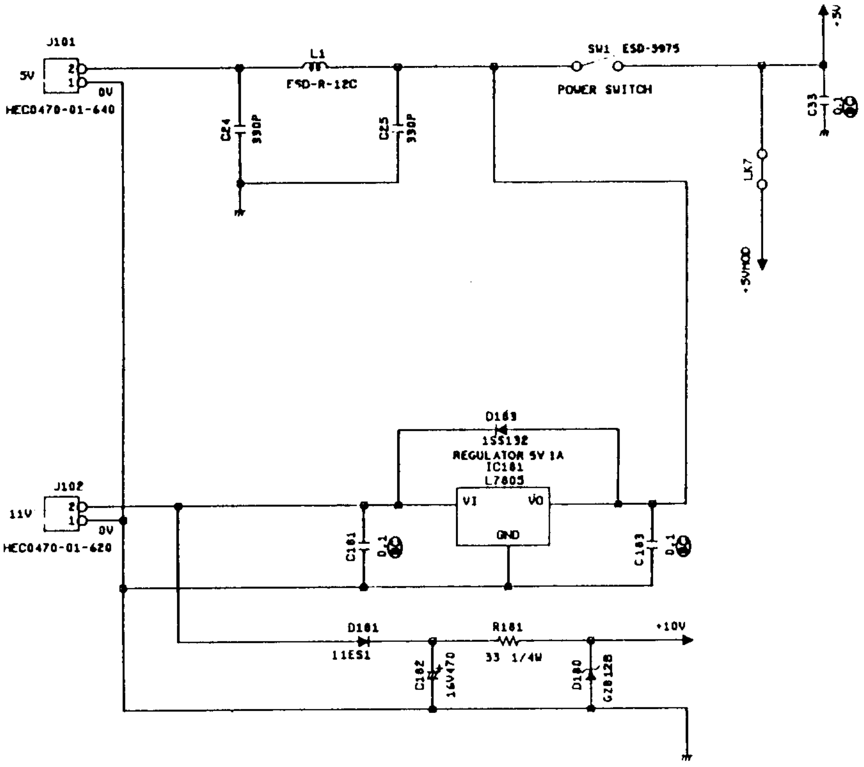
MAIN P.C.B. FRANCE (Top View)


A
B
C
D
1
2
3
IC102
IC2
IC14
IC16
IC101
IC1
IC15
IC10
IC11
IC17
IC181
MC0123A
2700-017P-3
1990 AMSTRAD PLC.
GAMES CONSOLE MAIN PCB
CARTRIDGE CONNECTOR
CE101
JOYSTICK 1
JOYSTICK 2
ANALOG JOYSTICK
J101
J102
J103
J104
J105
JD102
SW101
SW102
X1
X2
X3
L1
L3
L101
L102
L103
L104
VR101
VR102
D1
TP101
TP102
TP103
TP104
LK7

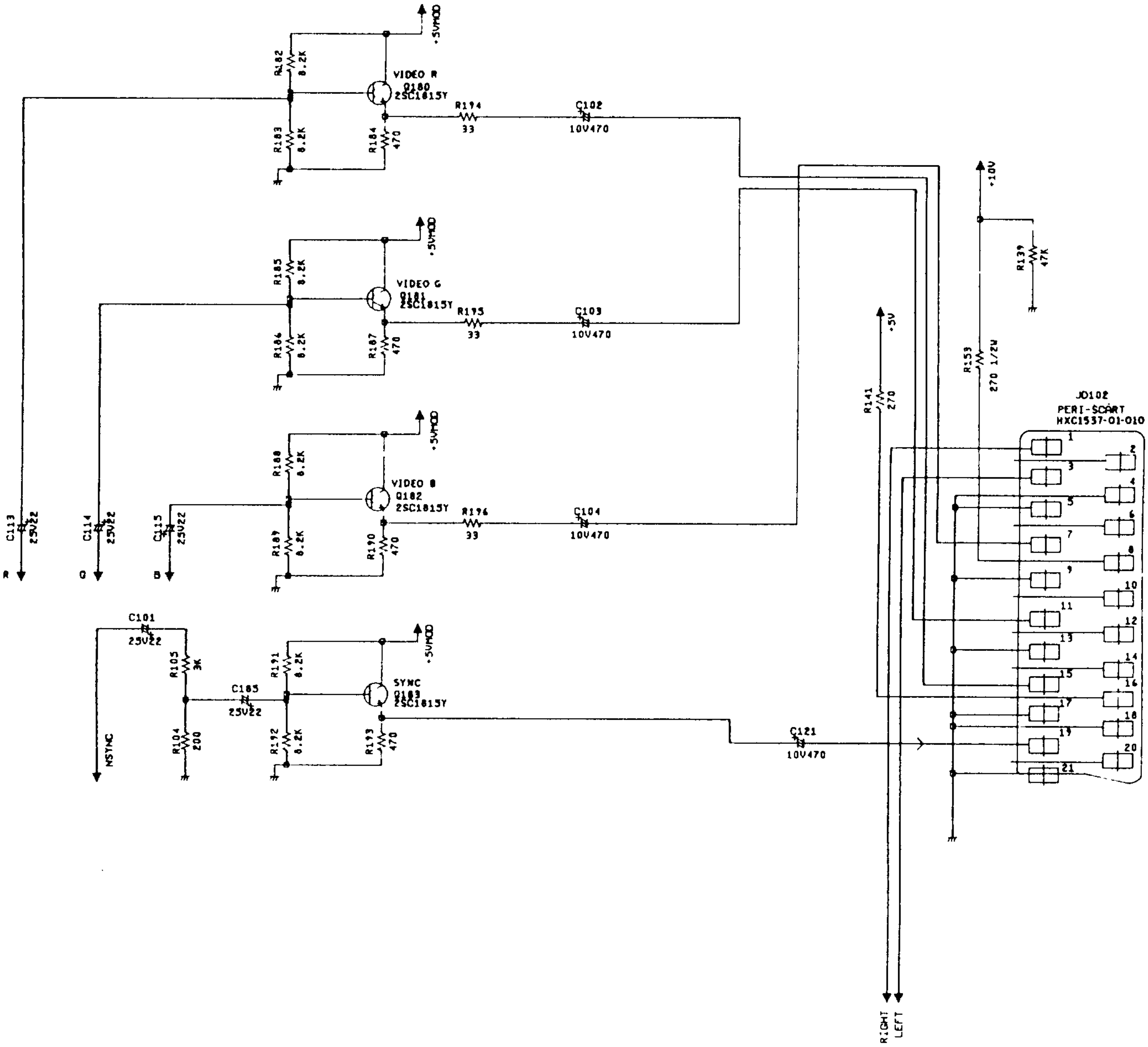
MAIN P.C.B. FRANCE (Bottom View)


A
B
C
D
1
2
3
MC0123A
2700-017P-3
1990 AMSTRAD PLC.
GAMES CONSOLE MAIN PCB
CARTRIDGE CONNECTOR
JOYSTICK 1
JOYSTICK 2
ANALOG JOYSTICK
IC101
IC102
J101
J102
J103
J104
J105
SW101
SW102
X1
X2
X3
L1
L3
L101
L102
L103
L104

POWER REGULATOR SCHEMATIC DIAGRAM (FRANCE)


J101
5V
2
1
0V
HEC0470-01-640
L1
ESD-R-12C
C24
330P
C25
330P
SW1 ESD-3975
POWER SWITCH
+5V
C33
0.1
LK7
+5VMOD
D183
1SS132
REGULATOR 5V 1A
IC181
L7805
VI
VO
GND
J102
11V
2
1
0V
HEC0470-01-620
C181
0.1
C183
0.1
D181
11ES1
C182
16V470
R181
33 1/4W
D180
GZB12B
+10V

OUTPUT INTERFACE (FRANCE)


+5VMOD
R182
8.2K
VIDEO R
Q180
2SC1815Y
R194
33
C102
10V470
R183
8.2K
R184
470
+5VMOD
R185
8.2K
VIDEO G
Q181
2SC1815Y
R195
33
C103
10V470
R186
8.2K
R187
470
+5VMOD
R188
8.2K
VIDEO B
Q182
2SC1815Y
R196
33
C104
10V470
R189
8.2K
R190
470
C113
25V22
C114
25V22
C115
25V22
R
G
B
C101
25V22
R105
3K
R104
200
HSYNC
C185
25V22
+5VMOD
R191
8.2K
SYNC
Q183
2SC1815Y
R192
8.2K
R193
470
C121
10V470
+10V
R139
47K
+5V
R153
270 1/2W
R141
270
JD102
PERI-SCART
HXC1537-01-010
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
RIGHT
LEFT

GX4000 ELECTRICAL PARTS LIST

Ref. No.	Description	Part No.
IC's		
IC1	IC AMS40489 Gate Array	40489
IC2	IC Z8400AB1N CPU	40080
IC8	IC MC74HC4051N ANA Multi	270996
IC9	IC LA6393D Dual Op Amp	170112
IC10, 11	IC KM41464AP-12 4064 RAM	173001
IC14	IC AY-3-8912 Sound Generator	40001
IC15	IC AMS40464 Video DAC	40464
IC16	IC PC74HCTO2P Quad Norgate	270999
IC17	IC UPC78L05 Reg SVOIA	190731
IC101	IC CXA1145P RGB Encoder	270975
IC102	IC UM1234E36 RF Modulator	271001
IC181	IC L7805 Reg SVIA	271002
IC401	IC AMS40982 Cartridge Gate Array	40982
IC402	IC AMS40908 Cartridge Gate Array	40908
Transistors		
Q3-5, 102, 105-110, 201, 202	TR 2SC1815Y, Silicon	177910
Q101	TR 2SA1015Y Silicon	170453
Diodes		
D1	D SLZ336B-16A/B-T1 LED	271003
D10, 11, 120, 121, 123-128, 183, 201, 202	D 1SS132 T	171582
D101	D MTZ6.8BT-77	171488
D130, 131	D 1SV68, Variable Cap.	271004
D132-137	D MTZ4.7BT-77	175021
D180	D GZB12B, ZENER	271005
D181	D 11ES1TA1, Silicon	271006
Coils		
L1	Filter Line ESD-R-12C	270751
L3	Coil Inductor LAL03KH470K	270992
L101	Delay Line SDL4101	270993
L102	Filter Band Pass H287BSJS-4438HWD	270994
L103, 104	Coil 10UH	175940
Switches		
SW1	Switch Slide ESD-3975	170002
SW101	Switch Slide SSSS91-749	270990
SW102	Switch Tact EVQ-QTE05G	270991
PCB's		
PCB101	PCB ASS'Y MC0123	
PCB401	PCB ASS'Y MC0121	
Miscellaneous		
J2	Socket IC DILB40P-8J	271007
J101	Jack DC HEC0470-01-640	271008
J102	Jack DC HEC0470-01-620	271009
J103	Jack Modular 215876-1	271010
J104	Jack DIN CSK150-81-30-244	271011
J105	Jack RCA 3.5 HSJ1061-01-440	271012
PD001	Paddle	270792
X1	Crystal CX0-824C 39.9025MHZ	271013
X101	Ceramic Oscillator CSA6.0MG	271014
X102	Ceramic Oscillator CSA5.5MG	271015
	Manual, Multi-Lingual	U1-GX4000
	AC Adapter, UK	270974
	AC Adapter, Euro	270973
	Cartridge Assy	41088

Ref. No.	Description	Part No.
Resistors: Carbon 1/6W		
22 OHM	R5, 89	152156
33 OHM	R46-54, 56, 57, 68, 69	152158
75 OHM	R106, 112, 129,130	152163
82 OHM	R80	152164
91 OHM	R72	152165
100 OHM	R120	152166
120 OHM	R81	152167
150 OHM	R13	152168
220 OHM	R87, 110, 119, 203, 206	152170
270 OHM	R141	152171
330 OHM	R75	152172
360 OHM	R140	271021
390 OHM	R82	152173
470 OHM	R86, 117	152174
680 OHM	R74, 107	152176
750 OHM	R132	152177
910 OHM	R71	240204
1K OHM	R61-63, 90, 127, 131, 133, 134	152179
1.2K OHM	R73, 111	151180
2K OHM	R103, 135	271022
2.2K OHM	R2, 2	152183
3K OHM	R105, 116, 149, 151	271023
3.3K OHM	R76-78, 84, 88	152185
4.7K OHM	R1, 27, 210	193789
5.6K OHM	R83	152189
10K OHM	R14, 17, 58-60, 64, 67, 102, 125, 148	152194
15K OHM	R79	152196
20K OHM	R124, 126	157639
22K OHM	R65, 66, 91	152198
47K OHM	R139	152203
68K OHM	R143	152205
100K OHM	R202, 205	152209
180K OHM	R23-26	152212
220K OHM	R201, 204	157641
Resistors: Carbon 1/4W		
33 OHM	R181	174852
Resistors: Metal 1/2W		
270 OHM	R153	176748
Resistors: Metal 1/6W		
820 OHM	R109	271024
1K OHM	R32, 34, 36, 38, 40, 42	271025
2K OHM	R31, 33, 35, 37, 39, 41, 43, 44	271026
3.9K OHM	R108	271027
6.98K OHM	R123	271028
27K OHM	R101, 113, 114, 147, 152	271029
33K OHM	R144	271030
47K OHM	R145, 146	178036
68K OHM	R70, 143, 150	271031
Capacitors: Ceramic		
47PF	C119	150515
82PF 50V	C140-142	270035
100PF 50V	C27, 31, 106, 131	240221
330PF 50V	C24, 25, 135-137	150518
0.01UF	C105, 124, 134, 138, 139	157577
0.1UF 12V	C1, 2, 8, 10, 11, 14, 15, 17-19, 33, 110, 122, 133, 181, 183, 184, 401	240223
Capacitors: Electrolytic		
1UF 50V	C201, 202	157563
10UF 50V	C26, 32, 34	240462
22UF 25V	C100, 101, 107, 109, 113-116, 118, 128	250409
100UF 10V	C30, 35, 120	240463
470UF 10V	C102-104, 121	270983
470UF 16V	R182	157630

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts.

CAUTION

Use an isolation transformer when performing any service on this chassis.

Before removing the anode cap, discharge electricity because it contains high voltage.

When removing a PCB or related component, after unfastening or changing wire, be sure to put wire back in its original position.

1-1: Prepare the following measurement tools for electrical adjustments.

1. Frequency Counter
2. DC Voltmeter

2. BASIC ADJUSTMENTS

2-1: DC 12V

1. Get the screen of initial pattern on screen from PC.
2. Set the bright and contrast controls to maximum position.
3. Connect the hot the digital voltmeter to **TP501**.
4. Adjust the **VR502** so that the digital voltmeter indicates DC 12.00±0.05V.

2-2: DC 5V

1. Put the following loads in the DC cord and set to the following values by using **VR501**.

LOAD	SETTING VALUE
Load 2.4A	DC 4.80±0.05V
Load 3.6±0.4A	DC 0V
No load(0A)	Less than 5.25V

2-3: H-HOLD

1. Shut off the input signal and set the screen to the free-run condition.
2. Connect a frequency counter to CRT heater.
3. Adjust **VR407** to obtain 15.625KHz reading.

2-4: SUB BRIGHT

1. Set the bright and contrast controls to minimum position.
2. Adjust **VR402** until letters of initial pattern on screen can be seen slightly.

2-5: V SIZE

1. Get the screen of border 26 pattern from PC.
2. Set the bright and contrast controls to maximum position.
3. Adjust the **VR406** so that the width "A" in border size become 152±2mm. **(Refer to Fig. 2-1)**

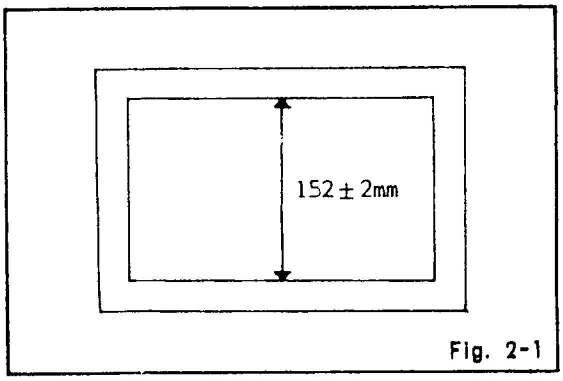
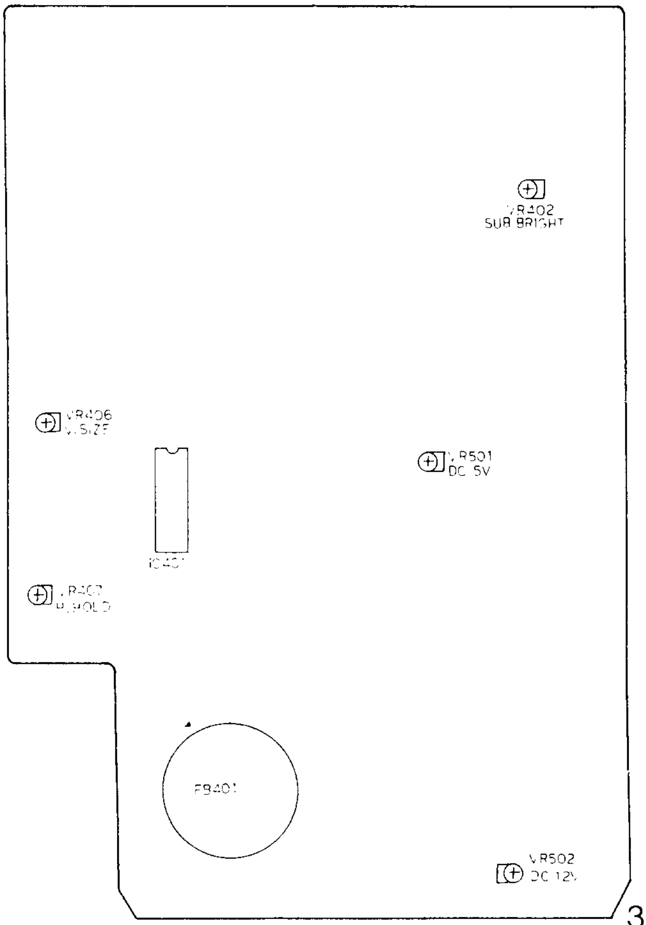


Fig. 2-1

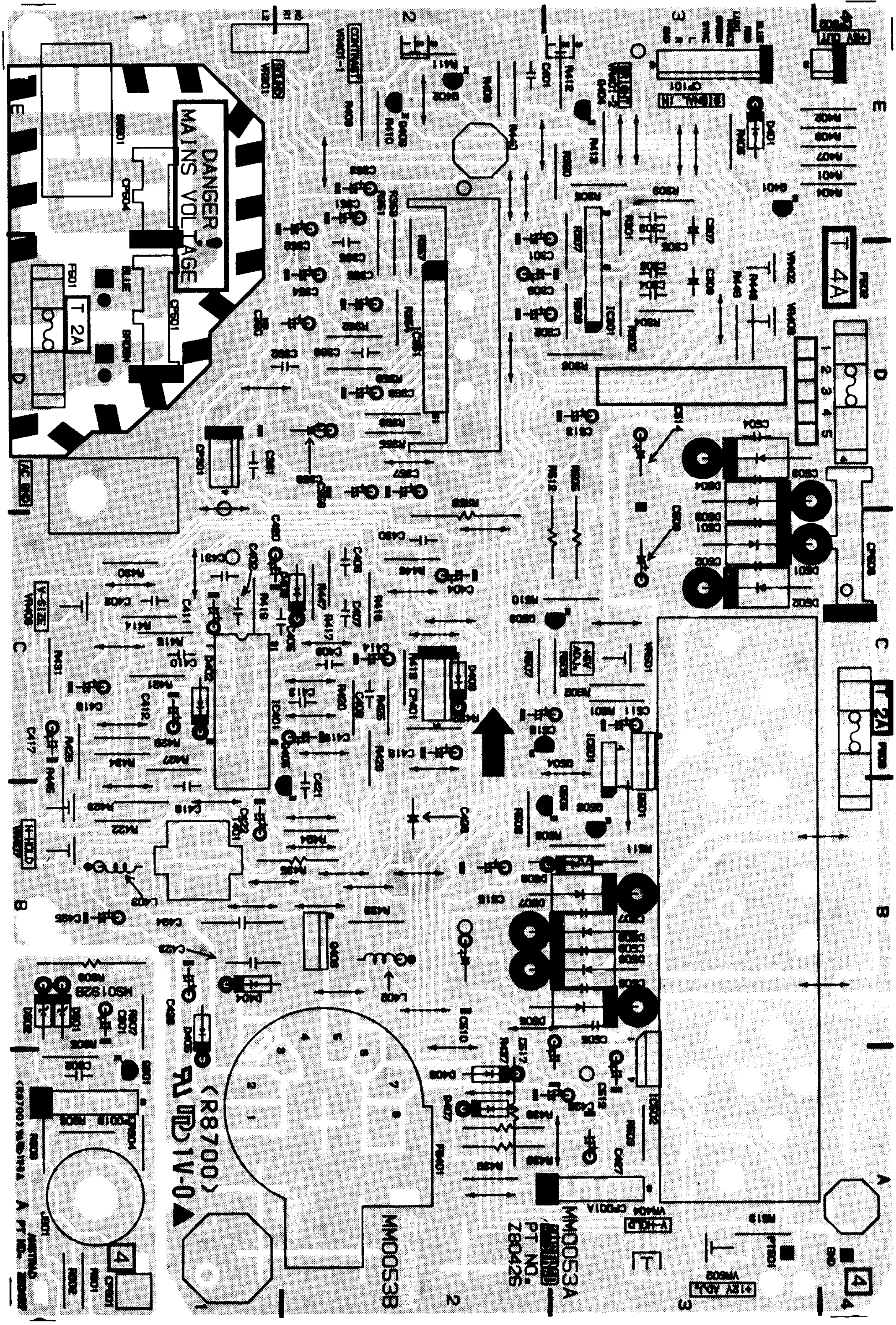
2-6: CENTERING

1. Set the bright and contrast controls to maximum position.
2. Get the screen of border 26 pattern from PC adjust it by means of the magnet on the back of DY so that it comes to the center of the screen.

MAJOR COMPONENTS LOCATION GUIDE

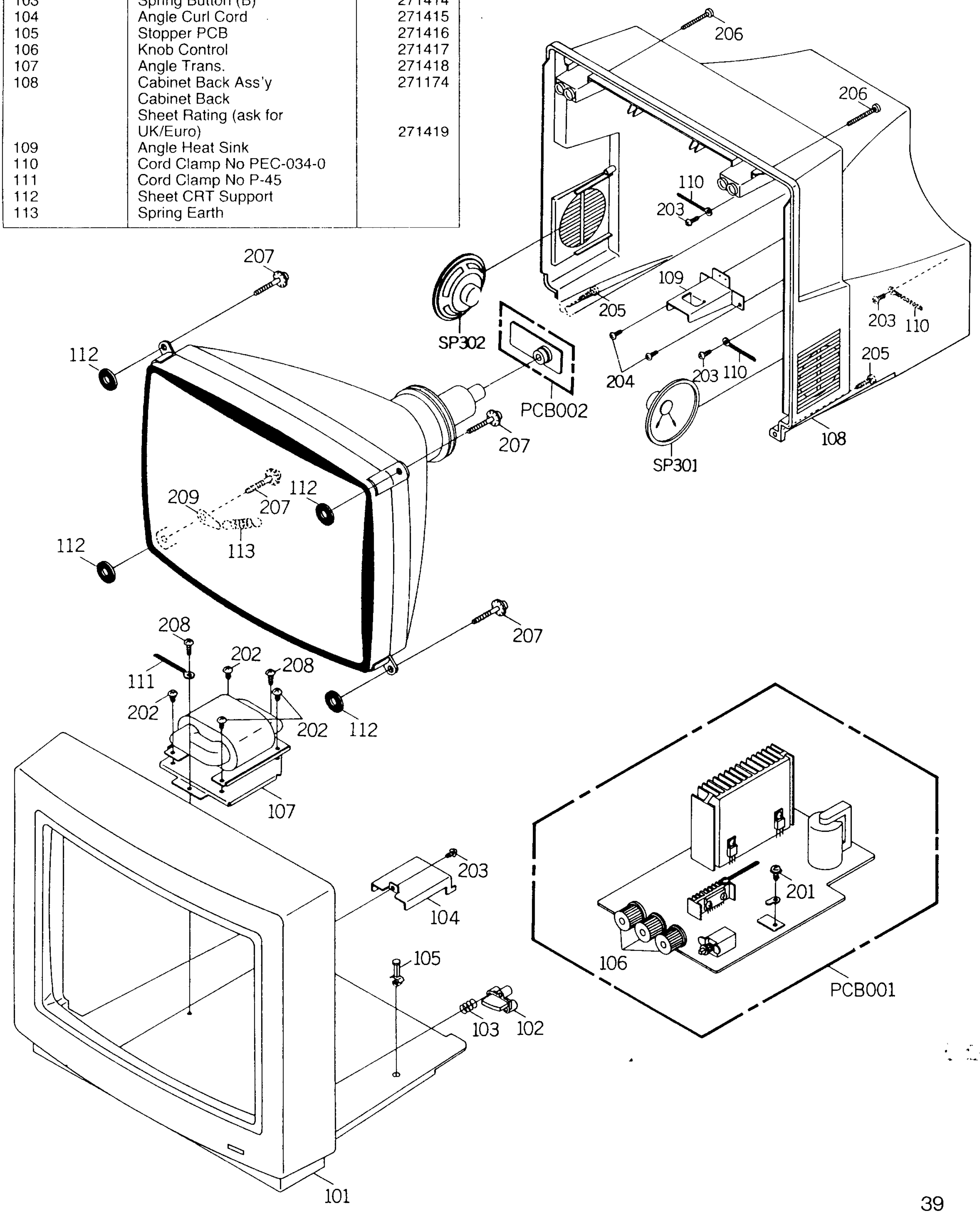


MONITOR / CRT P.C.B. Component Layout


DANGER
MAINS VOLTAGE
T 2A
T 4A
T 2A
<R8700>
1V-0
MM0053B
MM0053A
PT NO.
Z80426
A
B
C
D
E
1
2
3
4

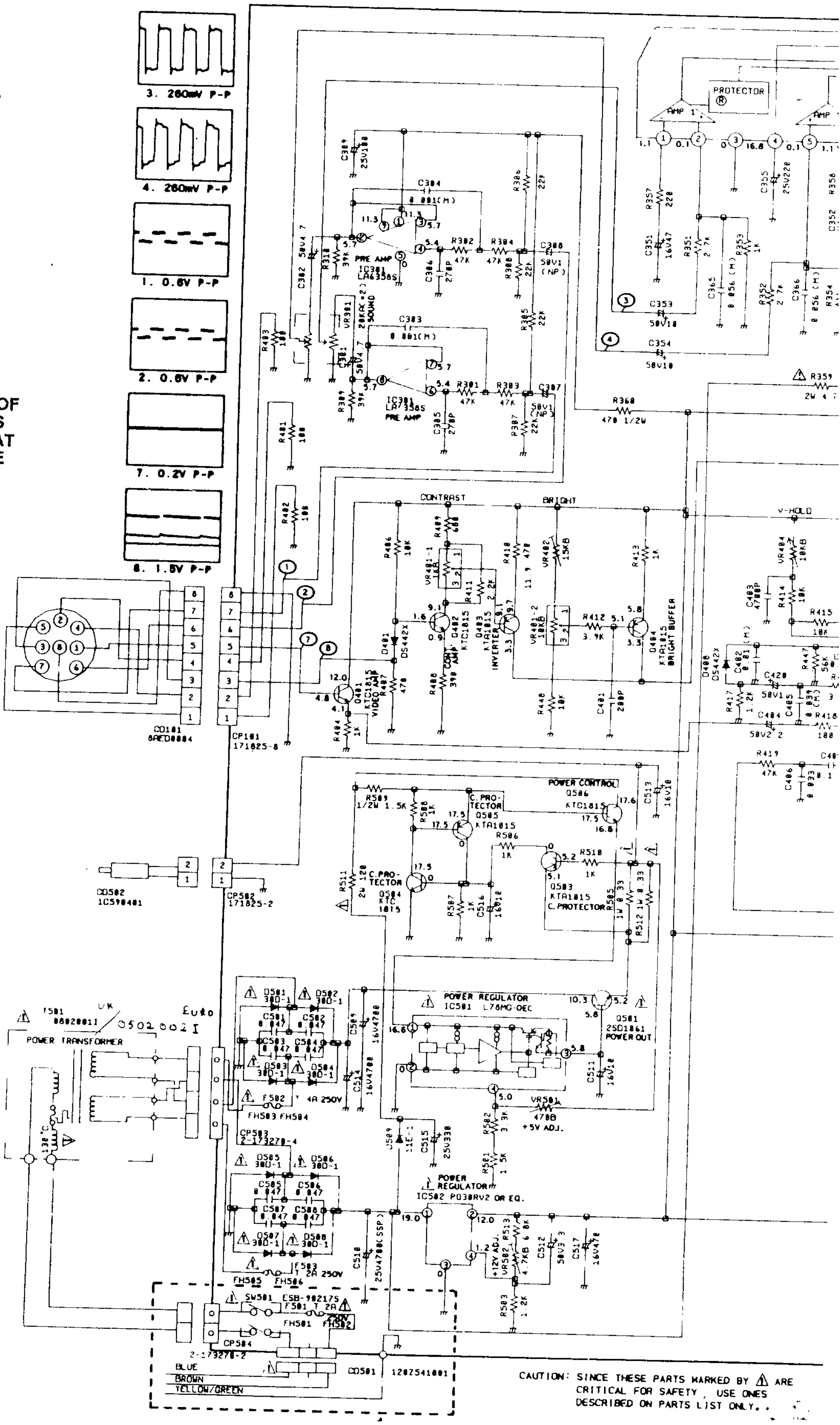
MM12 CABINET PARTS LIST

Ref. No.	Description	Part No.
Cabinet Parts		
101	Cabinet Ass'y	271173
	Cabinet Front	
	Plate Brand	
102	Button Power	271413
103	Spring Button (B)	271414
104	Angle Curl Cord	271415
105	Stopper PCB	271416
106	Knob Control	271417
107	Angle Trans.	271418
108	Cabinet Back Ass'y	271174
	Cabinet Back	
	Sheet Rating (ask for UK/Euro)	271419
109	Angle Heat Sink	
110	Cord Clamp No PEC-034-0	
111	Cord Clamp No P-45	
112	Sheet CRT Support	
113	Spring Earth	

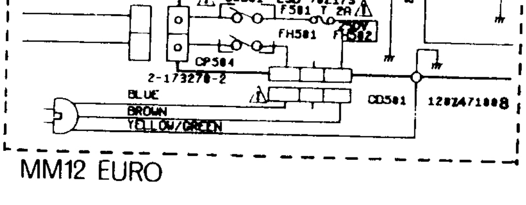

206
206
110
203
109
205
SP302
PCB002
204
203
110
203
110
205
108
SP301
207
112
207
112
209
207
113
112
207
208
202
208
111
202
202
112
107
203
104
105
103
102
101
201
106
PCB001

MM-12 MONITOR / CRT SCHEMATIC DIAGRAM

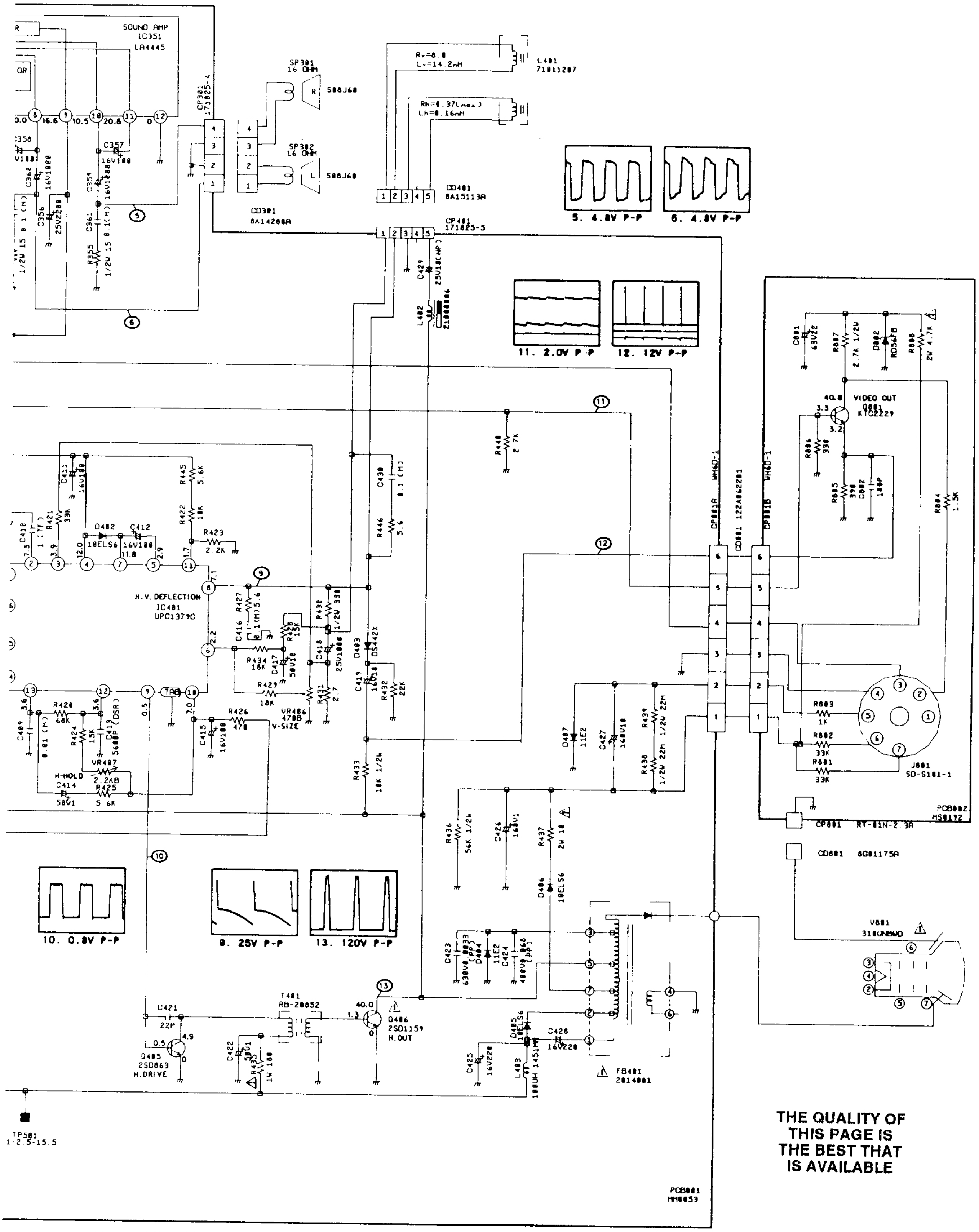
THE QUALITY OF THIS PAGE IS THE BEST THAT IS AVAILABLE


3. 260mV P-P
4. 260mV P-P
1. 0.6V P-P
2. 0.6V P-P
7. 0.2V P-P
8. 1.8V P-P
CD101 6AED0004
CP101 171825-8
C309 25V100
C304 0.001(M)
IC301 LA4358S PRE AMP
R310 39K
C302 50V4.7
R302 47K
R304 47K
R306 22K
C308 50V1 (NP)
R308 22K
C306 270P
VR301 20KX2 SOUND
C301 50V4.7
C303 0.001(M)
R301 47K
R303 47K
C307 50V1 (NP)
R309 39K
C305 270P
R305 22K
R307 22K
R403 100
R401 100
R402 100
PROTECTOR
AMP 1
C351 16V47
R357 220
R351 2.7K
R353 1K
C355 25V220
C353 50V10
C354 50V10
C365 0.056(M)
R352 2.7K
C366 0.056(M)
R359 2W 4.7
R360 470 1/2W
CONTRAST
BRIGHT
V-HOLD
R406 10K
R409 680
VR401-1 1KB
R411 2.2K
R410 470
VR402 15KB
R413 1K
Q402 KTC1815 CONT AMP
Q403 KTA1015 INVERTER
VR401-2 10KB
R412 3.9K
Q404 KTA1015 BRIGHT BUFFER
D401 DS442X
R407 470
R408 390
Q401 KTC1815 VIDEO AMP
R404 1K
R440 10K
C401 200P
VR404 10KB
C403 4700P
R414 10K
R415 10K
D406 DS442X
C402 0.01(M)
C420 50V1
R447 56K
R417 1.2K
C404
C405
R418 100
50V2.2
R419 47K
C406 0.033
POWER CONTROL Q506 KTC1815
R509 1/2W 1.5K
R508 1K
C.PRO-TECTOR Q505 KTA1015
R506 1K
R510 1K
C513 16V10
R511 2W 120
C.PRO-TECTOR Q504 KTC1815
R507 1K
C516 16V10
Q503 KTA1015 C.PROTECTOR
R505 1W 0.33
R512 1W 0.33
CD502 1C590401
CP502 171825-2
T501 0802001I
UK
Euro
0502002I
POWER TRANSFORMER
130°C
D501 30D-1
D502 30D-1
C501 0.047
C502 0.047
C503 0.047
C504 0.047
D503 30D-1
D504 30D-1
C509 16V4700
C514 16V4700
F502 4A 250V
FH503 FH504
CP503 2-173270-4
POWER REGULATOR IC501 L78MG-OEC
Q501 2SD1861 POWER OUT
C511 16V10
VR501 470B +5V ADJ.
R582 3.3K
D509 11E-1
C515 25V330
R581 1.5K
D505 30D-1
D506 30D-1
C505 0.047
C506 0.047
C507 0.047
C508 0.047
D507 30D-1
D508 30D-1
F503 T 2A 250V
FH505 FH506
C510 25V4700(SSP)
POWER REGULATOR IC502 PQ30RV2 OR EQ.
R513 6.8K
VR502 4.7KB +12V ADJ.
C512 50V3.3
C517 16V470
R583 1.2K
SW501 ESB-90217S
F501 T 2A
250V
FH501 FH502
CP504 2-173270-2
BLUE
BROWN
YELLOW/GREEN
CD501 1202541001

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED ON PARTS LIST ONLY.


SW501 ESB-90217S
F501 T 2A
250V
FH501 FH502
CP504
2-173270-2
BLUE
BROWN
YELLOW/GREEN
CD501
1202471008

MM12 EURO


SOUND AMP
IC351
LA4445
CP301 171825-4
SP301 16 OHM
SP302 16 OHM
S08J60
CD301 8A14288A
Rv=8.8
Lv=14.2mH
Rh=0.37(max)
Lh=0.16mH
L401 71011207
CD401 8A15113A
CP401 171825-5
C429 25V10(NP)
L402 Z1000006
5. 4.8V P-P
6. 4.8V P-P
11. 2.0V P-P
12. 12V P-P
VIDEO OUT
Q801 KTC2229
R807 2.7K 1/2W
D802 RD56FB
R808 2W 4.7K
C801 63V22
R806 330
R805 390
C802 100P
R804 1.5K
R440 2.7K
C430 0.1 (M)
R446 5.6
CP801A WH6D-1
CD801 122A062Z01
CP801B WH6D-1
H.V. DEFLECTION
IC401
UPC1379C
R445 5.6K
R422 10K
R423 2.2K
R421 33K
C411 16V100
D402 10ELS6
C412 16V100
R427 5.6
C416 1(M)
R428 15K
R430 1/2W 330
C418 25V1000
D403 DS442X
R434 18K
C417 50V10
R429 18K
R431 2.7
C419 16V10
R432 22K
VR406 470B V-SIZE
R426 470
C415 16V100
R420 68K
R424 15K
C413 (DSR) 560P
C409 0.01 (M)
VR407 2.2KB
H-HOLD
C414 50V1
R425 5.6K
R433 10K 1/2W
D407 11E2
C427 160V10
R439 1/2W 22M
R438 1/2W 22M
R803 1K
R802 33K
R801 33K
J801 SD-S101-1
PCB802 HS0172
CP801 RY-01N-2.3A
CD801 8G01175A
V801 310GNBWO
R436 56K 1/2W
C424 160V1
R437 2W 10
D406 10ELS6
10. 0.8V P-P
9. 25V P-P
13. 120V P-P
C423 630V 0033 (PP)
D404 11E2
C424 400V 0068 (PP)
C421 22P
T401 RB-20052
Q406 2SD1159 H.OUT
Q405 2SD863 H.DRIVE
C422 50V1
R435 1W 100
C425 16V220
D405 10ELS6
C426 16V220
L403 100UH 1451M
FB401 2014001
TP501 1-2.5-15.5
PCB801 HM0053

THE QUALITY OF THIS PAGE IS THE BEST THAT IS AVAILABLE

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

MM12 ELECTRICAL PARTS LIST

Ref. No.	Description	Part No.
IC's		
IC301	IC LA6358S	240015
IC351	IC LA4445	271162
IC401	IC UPC1379C	271163
IC501	IC L78MG-OEC	170446
IC502	IC PQ30RV2	271160
Transistors		
Q401, 402, 504, 506	TR KTC1815	170447
Q403, 404, 503, 505	TR KTA1015Y	170453
Q404	TR 2SD863E-AE	271164
Q406	TR 2SD1159	171044
Q501	TR 2SD1061	271410
Q801	TR KTC2229Y	170624
Diodes		
D401, 403, 408	D DS442X-BT, Silicon	1422117
D402, 405, 406	D 10ELS6TA1, Rectifier	171550
D404, 407	D 11E2TA1, Silicon	171049
D501-508	D 30D-1 FC, Rectifier	170625
D509	D 11E1TA1, Silicon	171050
D802	D RD56FB, Zener	170627
Coils		
L401	DY 71011207	271408
L402	Coil Linearity 21000006	171558
L403	Coil Inductor 100UH	175867
Switches		
SW501	Switch Push ESB-90217S	171511
PCB's		
PCB001	PCB ASS'Y MM0053-S	
PCB002	PCB ASS'Y MS0192	
Miscellaneous		
T401	Trans. Horiz. Drive RG-20852	271171
T501	Trans. Power AC 0408020011 (UK)	271170/S
T501	Trans. Power AC 05020021 (Euro)	271425
J801	Socket CRT SD-S101-1	271427
CV501	Cover AC Cord	271428
F501, 503	Fuse Bet 2A (T) 250V	193357
F502	Fuse Bet 4A (T) 250V	152603
FB401	Transformer Flyback 2014001	177054
FH501, 503, 505	Holder Fuse HO451	271429
FH502, 504, 506	Holder Fuse HO452	271430
S501	Spacer Bush-M	176849
SP301, 302	Speaker SO8J60	271169
V801	Tube Cathode Ray 310GNBWD	271168
CD101	Cord DIN (7 Pin)	271176
CD502	Cord DC 6.5mm	271177
Variable Resistors		
VR301	VROT EVJ-COOF25A24	271403
VR401	VROT EVU-G2AFA0007	271404
VR402	VRSF RHO632CE4R01	271405
VR404	VROT RK09K1110APPA	271406
VR406, 407, 501, 502	VRSF RH0638CS2R02A	271407
Resistors: Metal Oxide		
0.33 OHM 1W	R505, 512	271444
4.7 OHM 2W	R359	271445
10 OHM 2W	R437	271446
120 OHM 2W	R511	240216
180 OHM 1W	R435	271447
4.7K OHM 2W	R808	271448
Resistors: Solid		
22M OHM 1/2W	R438, 439	271449

Ref. No.	Description	Part No.
Resistors: Carbon 1/6W		
39K OHM	R309, 310	1420145
Resistors: Carbon 1/4W		
2.7 OHM	R431	271435
5.6 OHM	R427, 446	271436
100 OHM	R401-403, 418	240507
220 OHM	R357, 358	193589
330 OHM	R806	193591
390 OHM	R408, 805	271437
470 OHM	R407, 410, 426	193592
680 OHM	R409	240509
1K OHM	R353, 354, 404, 413, 449, 506-508, 510, 803	193594
1,2K OHM	R417, 503	271438
1.5K OHM	R501, 804	271439
2.2K OHM	R411, 423	193595
2.7K OHM	R351, 352, 440	193596
3.3K OHM	R502	193597
3.9K OHM	R412, 416	271440
5.6K OHM	R425, 445	10079
6.8K OHM	R513	193598
10K OHM	R406, 414, 415, 422, 448	240511
15K OHM	R424, 428	271442
18K OHM	R429, 434	193700
22K OHM	R305-308, 432	193701
33K OHM	R421, 801, 802	10097
47K OHM	R301-304, 419	240512
56K OHM	R447	10103
68K OHM	R420	271443
Resistors: Carbon 1/2W		
15 OHM	R355, 356	271432
330 OHM	R430	174834
470 OHM	R360	201711
1.5K OHM	R509	250047
2.7K OHM	R807	176749
10K OHM	R433	271433
56K OHM	R436	271434
Capacitors: Ceramic		
10PF	C802	193416
22PF 50V	C421	193719
200PF	C401	172179
270PF 50V	C305, 306	157677
1000PF 50V	C407	240222
0.0047UF 50V	C403	201719
0.033UF 50V	C406	153922
0.047UF 50V	C501-508	152645
Capacitors: Metal Plastic		
1UF 50V	C410	271455
Capacitors: Plastic		
0.0056UF	C413	174818
Capacitors: Polypropylene		
0.0033UF 630V	C423	157740
0.068UF 400V	C424	170620
Capacitors: Electrolytic		
1UF 50V	C307, 308, 414, 420, 422	157563
1UF 160V	C426	271450
2.2UF 50V	C404	157672
3.3UF 50V	C512	271451
4.7UF 50V	C301, 302	157565
10UF 16V	C419, 511, 513, 516	157581
10UF 25V	C429	271452
10UF 50V	C353, 354, 417	240462
10UF 160V	C427	170608
22UF 63V	C801	170609
47UF 16V	C351, 352	172074
100UF 16V	C357, 358, 411, 412, 415	157568
100UF 25V	C309	157569
220UF 16V	C425, 428	240464
220UF 25V	C355	152565
330UF 25V	C515	170836
470UF 16V	C517	157630
1000UF 16V	C359, 360	271453
1000UF 25V	C418	152567
2200UF 25V	C356	157653
4700UF 16V	C509, 514	271454
4700UF 25V	C510	240241

CM-14
SECTION

CM 14 COLOUR MONITOR

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts.

CAUTION

Use an isolation transformer when performing any service on this chassis.

Before removing the anode cap, discharge electricity because it contains high voltage.

When removing a PCB or related component, after unfastening or changing wire, be sure to put wire back in its original position.

1-1: Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Frequency Counter
3. White Balance Signal Generator
4. White Balance Checker
5. DC Voltmeter

2. BASIC ADJUSTMENTS

2-1: +5V

1. Load 2.4A into DC out.
2. Connect the DC voltmeter to DC out.
3. Adjust **VR501** until voltage is 4.8±0.03V.
4. After adjustments, verify if the voltage is less than 5.25V in no-load mode.

2-2: H-HOLD

1. Shut off the input signal and set the screen to the free-run condition.
2. Connect a frequency counter to CRT heater.
3. Adjust **VR403** to obtain 15.625KHz reading.

2-3: CUT OFF

1. Shut off the input signal and set the screen to the free-run condition.
2. Set the bright control to maximum position.
3. Set **VR801**, **VR803**, **VR804** and **VR805** to center positions.
4. Connect the oscilloscope to collector of Q802.
5. Adjust **VR402** to obtain 125V as shown in **Fig. 2-1**.
6. Then, short the first pin and the second pin in CP402.
7. Keeping the condition, adjust the horizontal line on the picture to a extent of lighting faintly.

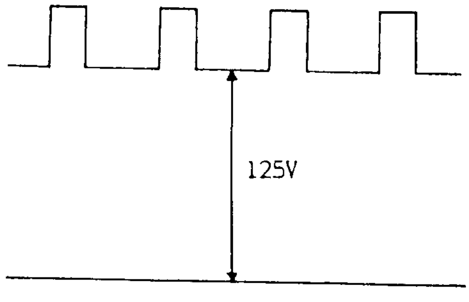


Fig. 2-1

2-4: SUB BRIGHT

1. Shut off the input signal and set the screen to the free-run condition.
2. Set the bright control to maximum position
3. Connect the oscilloscope to collector of Q802.
4. Adjust **VR402** to obtain 123 ~ 124V as show in **Fig. 2-2**.

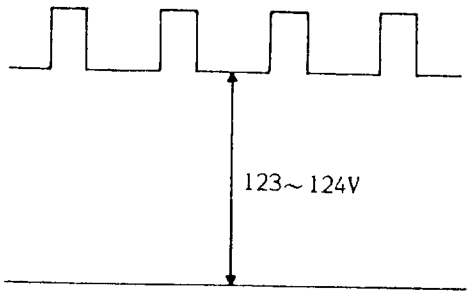


Fig. 2-2

2-5: WHITE BALANCE

1. Input 75% white and 25% white patterns to the monitor with the white balance signal generator.
2. Set the SW1 of the white balance signal generator to auto position. Adjust high control of the white balance signal generator until green of the white balance checker is centered for 75% white. Adjust low control until green is centered for 25% white.
3. Adjust **VR802** and **VR805** until blue of white balance checker is centered. Adjust **VR801** and **VR803** until red of white balance checker is also centered.

2-6:V.SIZE

1. Set the bright control to maximum position
2. Receive the monocrome pattern.
3. Adjust **VR406** to AB=CD as shown in **Fig. 2-3**.

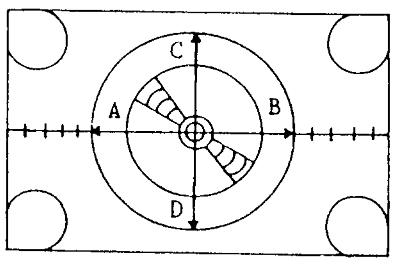


Fig. 2-3

2-7: FOCUS

1. Set the bright control to maximum position.
2. Adjust the picture by using focus volume.

3. PURITY AND CONVERGENCE ADJUSTMENT

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)** If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen. Adjust the pair of purity magnets so the color at ends are equally wide.
3. Move the deflection yoke backward (To neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

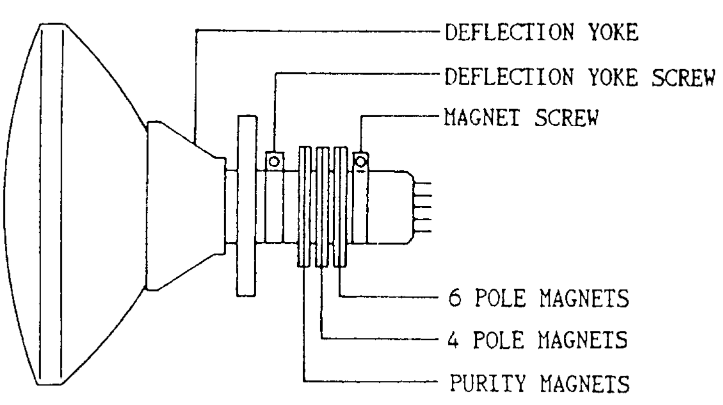


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

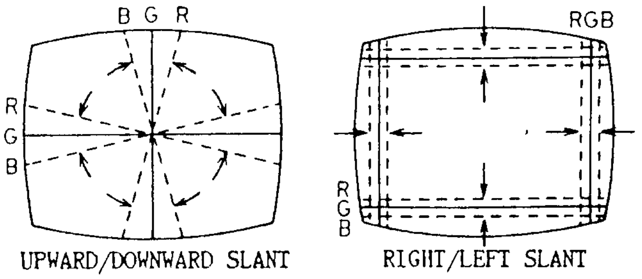
1. Receive the crosshatch pattern from color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

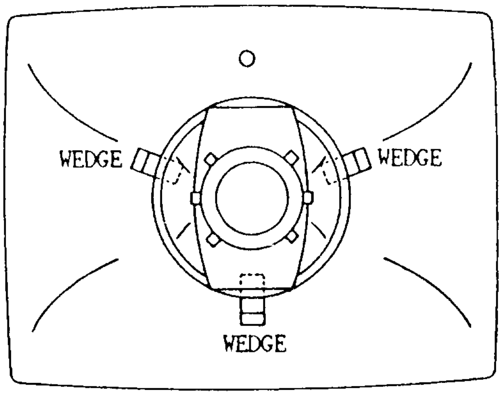
Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

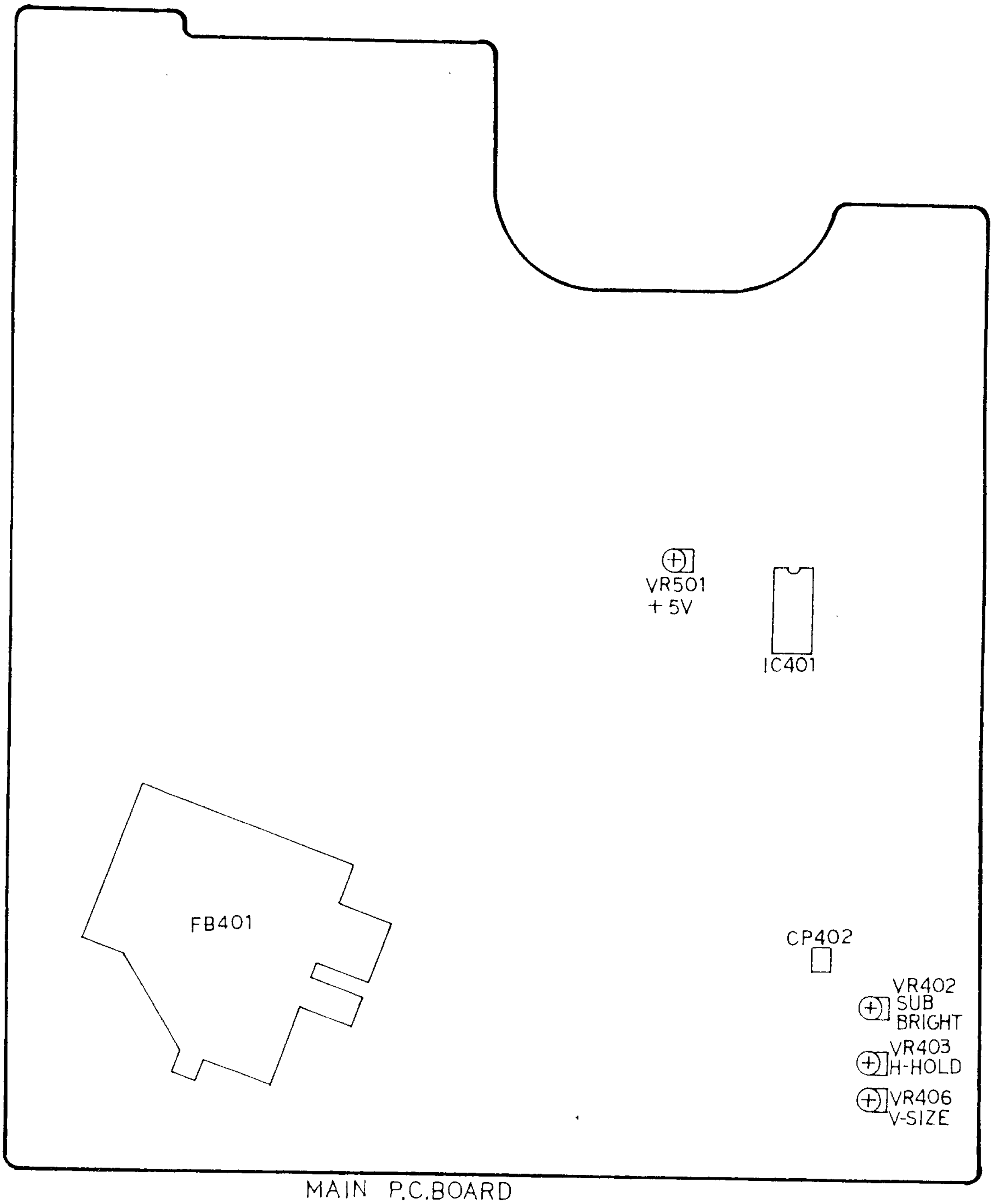
Fig. 3-2-a



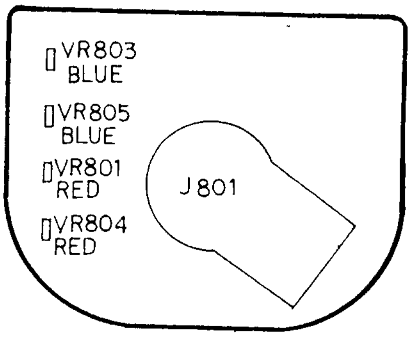
WEDGE POSITION

Fig. 3-2-b

MAJOR COMPONENTS LOCATION GUIDE


VR501
+5V
IC401
FB401
CP402
VR402
SUB
BRIGHT
VR403
H-HOLD
VR406
V-SIZE

MAIN P.C.BOARD


VR803
BLUE
VR805
BLUE
VR801
RED
VR804
RED
J801

CRT P.C.BOARD

CM14 ELECTRICAL PARTS LIST

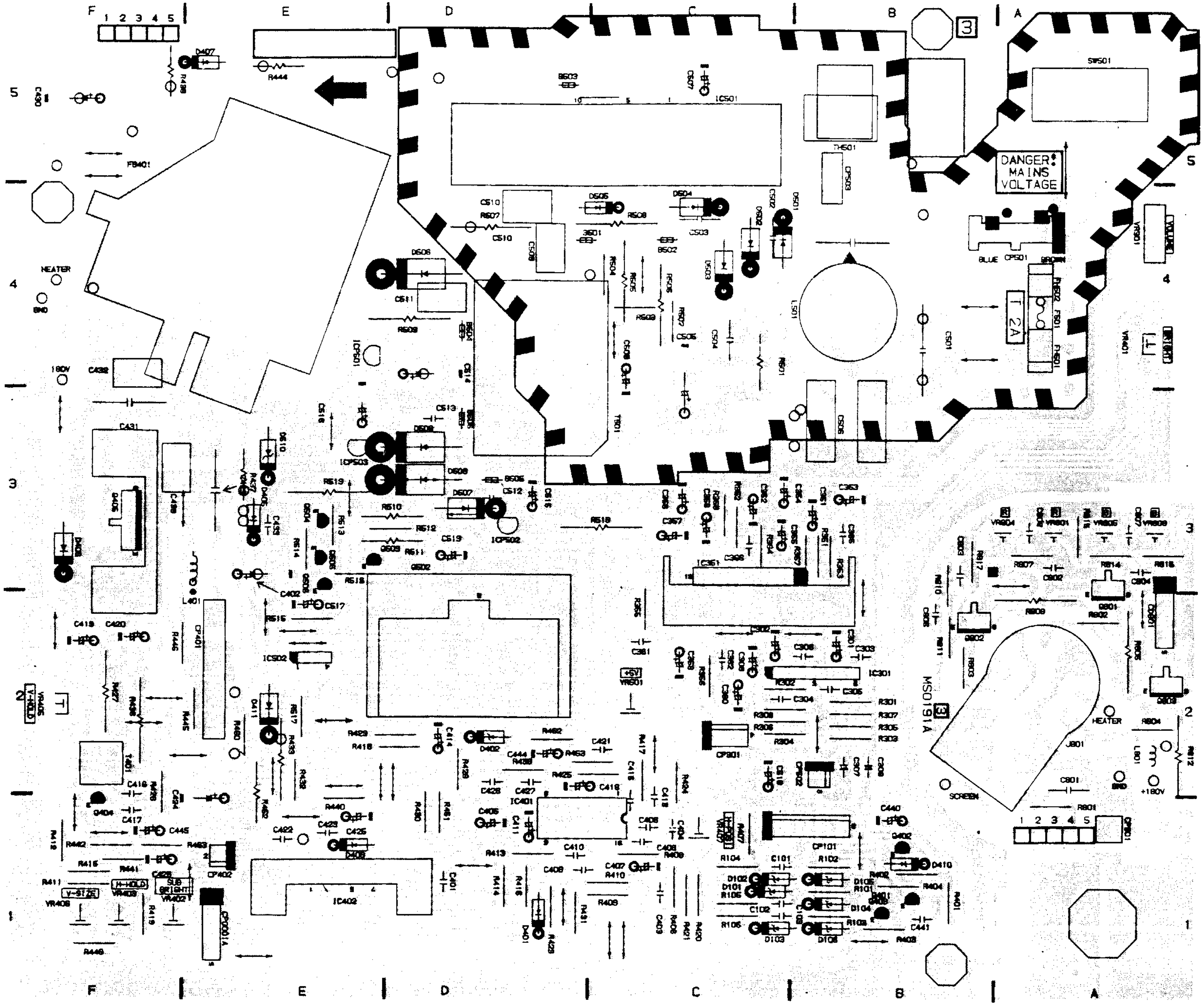
Ref. No.	Description	Part No.
IC's		
IC301	IC LA635S	240015
IC351	IC LA4445	271162
IC401	IC LA7800	1400106
IC402	IC LA7830	170444
IC501	IC STK73410	271151
IC502	IC L78 MG-OEC	170446
Transistors		
Q401, 402, 506	TR 2SC1815Y, Silicon	170447
Q403	TR 2SA950Y, Silicon	170448
Q404	TR 2SC2271-AE, Silicon	1409202
Q405	TR 2SD1877, Silicon	271152
Q502	TR SD1667, Silicon	177045
Q503, 505	TR 2SA1015Y, Silicon	170453
Q504	TR 2SC2120Y, Silicon	170113
Q801-803	TR 2SC3417, Silicon	271181
Diodes		
D101-103	D GZA6.2 Y BT Zener	171552
D104-106	D GZA6.8 Y BT Zener	175636
D401, 410	D 1S2472T-77, Silicon	170455
D402	D GZA11 Y BT Zener	810339
D405, 406, 408	D 10ELS6TA1 Rectifier	171550
D407, 505	D DFD05TG-BT Rectifier	171490
D411	D 11E1TA1 Silicon	171050
D501-504	D 20E10FA13 Silicon	176039
D506, 507	D 15DF6-FC Silicon	271180
D508, 509	D 30DF2-FC Silicon	171555
D510	D R2M-LFB3 Avalanche	1400122
Coils		
L401	Coil Linearity	271186
L501	Coil Line Filter AC	171502
L502	Coil Degauss	271187
L801	Coil 100UH	175867
Switches		
SW501	Switch Push ESB-90217S	171511
PCB's		
PCB001	PCB ASS'Y MM0052-C	
PCB002	PCB ASS'Y MS0191	
Miscellaneous		
T401	Trans. Horiz. Drive 305Y001	171506
T501	Trans. Switching 8139012	271188
J801	Socket CRT HPS1171-01-050	171514
F501	Fuse Bet 2A(T) 250V	193357
FB401	Trans. Flyback 3714016	271189
FH501	Holder Fuse H0451	271429
FH502	Holder Fuse H0452	271430
ICP401	IC Protector ICP-N50	171547
ICP501	IC Protector ICP-N20T104	150442
ICP502	IC Protector ICP-N38T104	271157
ICP503	IC Protector ICP-N75T104	171057
SP301, 302	Speaker S08J60	271169
TH501	Degauss Element ERP-F5B0M180K	171533
V001	CRT 370KRB22-TC21 (SPYB)	271190
CD101	Cord DIN (7 pin)	271176
CD502	Cord DC 6.5 mm	271177

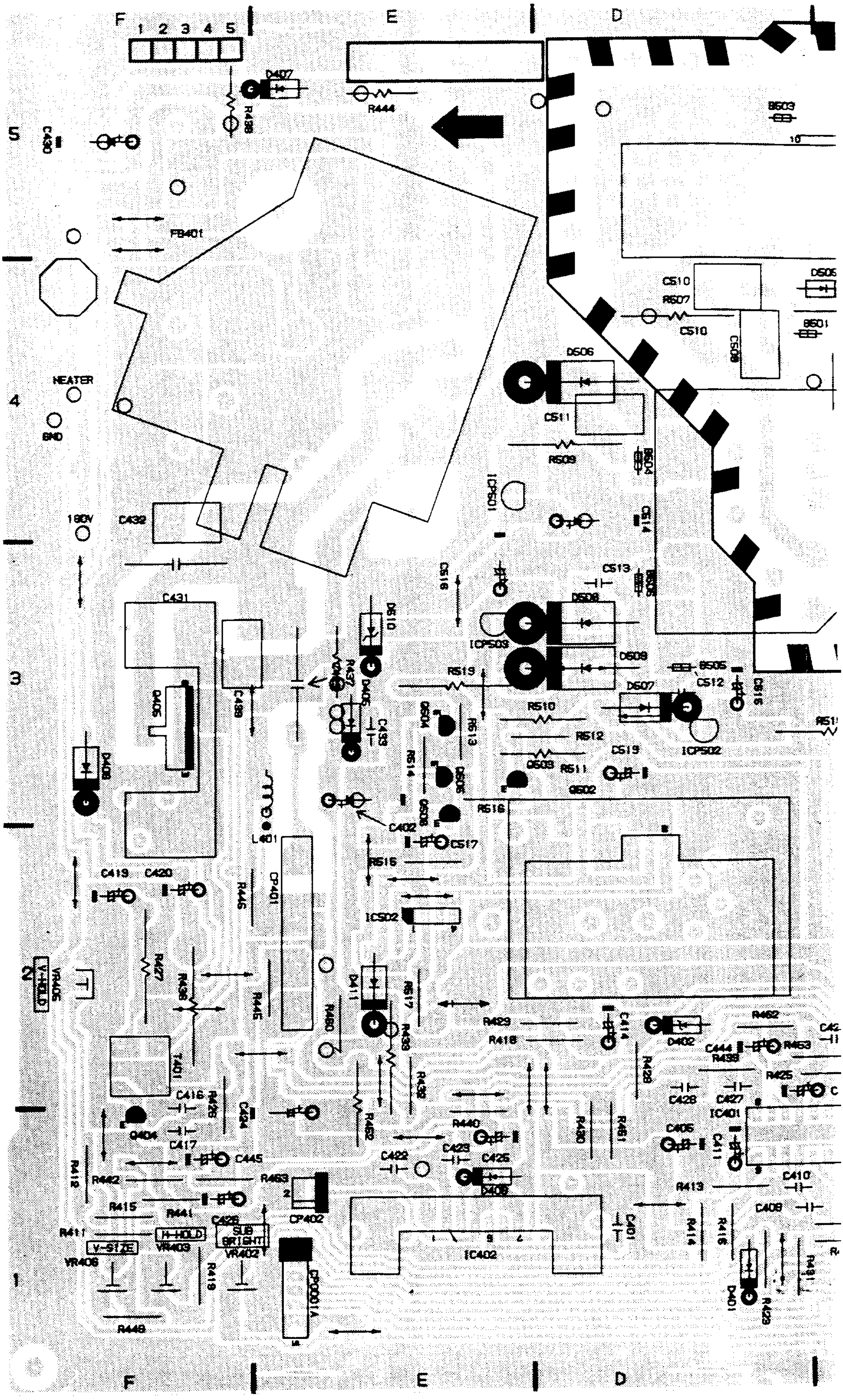
Ref. No.	Description	Part No.
Variable Resistors		
VR301	VROT EVJ-C00F25A24	271403
VR401	VROT EVU-E2AF25B52	271182
VR402, 403, 407	VRSF EVNDXAA02B03	271183
VR405	VROT RK09K1110APQA	271184
VR406, 501	VRSF EVNDXAA02B13	271185
VR801	VRSF 5K OHM Red	171696
VR802	VRSF 5K OHM Green	171697
VR803	VRSF 5K OHM Blue	171698
VR804	VRSF 500 OHM Red	171699
VR805	VRSF 500 OHM Blue	171700
Resistors: Carbon 1/6W		
39K OHM	R309, 310	152201
Resistors: Carbon 1/4W		
100 OHM	R101-103, 810	240507
180 OHM	R415, 807	193588
220 OHM	R357, 358, 407, 416	193589
270 OHM	R811, 814	193590
330 OHM	R401, 404	193591
1K OHM	R353, 354, 411, 423, 432, 453, 504, 512, 514-517, 815, 816	193594
1.5K OHM	R420, 421, 441	271439
1.8K OHM	R402, 403, 442, 462	271202
2.2K OHM	R410	193595
2.7K OHM	R104-106, 351, 352, 817	193596
3.3K OHM	R406	193597
8.2K OHM	R418, 419	271203
10K OHM	R428, 429	240511
12K OHM	R409, 424	10087
15K OHM	R431	271442
22K OHM	R305-308, 414	193701
27K OHM	R425	193702
33K OHM	R440	10097
47K OHM	R301-304, 412	240512
56K OHM	R417	10103
82K OHM	R439, 463	271204
120K OHM	R430	271205
150K OHM	R451	271206
180K OHM	R408	271207
220K OHM	R413	193706
Resistors: Carbon 1/2W		
1.5 OHM	R449	271208
15 OHM	R355, 356	271432
220 OHM	R433	271209
470 OHM	R445	201711
1K OHM	R513	240214
2.2K OHM	R446, 460	271210
2.7K OHM	R802-804	176749
4.7K OHM	R426	176750
120K OHM	R502	271211
270K OHM	R503	271212
1M OHM	R801	271213
Resistors: Cement		
5.6 OHM 5W	R501	271214
15 OHM 7W	R436	170417
Resistors: Fuseable		
3.3 OHM 1/2W	R438	170138
8.2 OHM 1/4W	R444	271215
Resistors: Metal Oxide		
0.33 OHM 1W	R510, 511	271444
2.2 OHM 3W	R508	271216
3.9 OHM 2W	R518	271217
15 OHM 2W	R509	271218
22 OHM 2W	R433	271249
22 OHM 3W	R505	271219
33 OHM 3W	R506, 507	271220
82 OHM 2W	R519	271221
1K OHM 1W	R452	271222
3.9K OHM 2W	R427	271223
15K OHM 2W	R805, 808, 812	271224

CM14 ELECTRICAL PARTS LIST

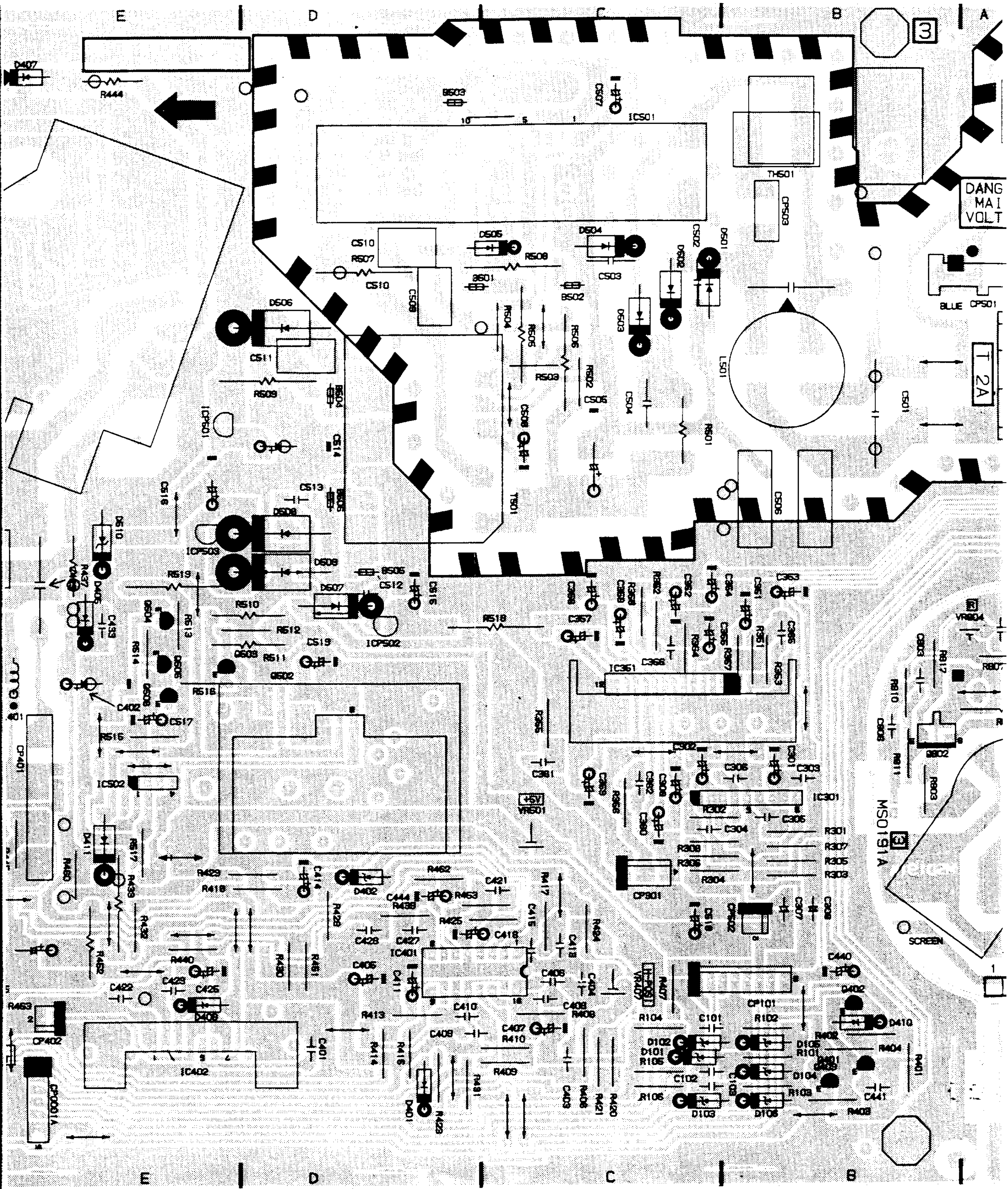
Ref. No.	Description	Part No.
Capacitors: Ceramic		
22PF	C416	271236
100PF 500V	C403, 441	271237
220PF	C806	157575
220PF 500V	C423	174811
240PF	C804, 807, 808	271238
270PF	C305, 306	157677
270PF 500V	C433	271239
330PF	C803	240233
470PF 2KV	C510	176751
560PF 500V	C417	271240
680PF	C802	806223
1000PF 2KV	C801	271241
1000PF 500V	C512, 513	271242
1500PF 2KV	C432	271243
2200PF 2KV	C502-504	174812
2200PF 125V	C506	271244
0.0015UF 2KV	C511	271245
0.0022UF 2KV	C509	271246
Capacitors: Plastic		
0.0056UF	C415	174818
Capacitors: Metal Polypropylene		
0.0082UF 1600V	C431	271247
0.1UF AC250V	C501	171609
0.82UF 200V	C429	271248
Capacitors: Tantalum		
1UF 16V	C411	271234
2.2UF 16V	C426	271235
Capacitors: Polyester		
0.001UF 50V	C303, 304, 401	240250
0.0015UF 50V	C408	271230
0.0047UF 50V	C421	271231
0.01UF 50V	C413, 427	250419
0.015UF 50V	C409	152389
0.039UF 50V	C404	177154
0.047UF 50V	C406, 446	251526
0.056UF 50V	C365, 366	157546
0.068UF 50V	C410, 428	271232
0.1UF 50V	C361, 362	250066
0.15UF 100V	C422	271233
Capacitors: Electrolytic		
1UF 50V	C307, 308, 414, 508	157563
1UF 160V	C419, 445	271225
2.2UF 50V	C440, 444	157672
4.7UF 50V	C301, 302, 407, 420	157565
10UF 16V	C519	157581
10UF 25V	C517	271452
10UF 50V	C353, 354	240462
10UF 100V	C507	271226
22UF 250V	C430	170419
47UF 16V	C351, 352, 418	172074
100UF 16V	C357, 358	157568
100UF 25V	C309	157569
100UF 35V	C425	157570
150UF 400V	C505	157792
220UF 25V	C355	152565
220UF 160V	C514	170851
470UF 16V	C405	157630
470UF 25V	C356	271227
470UF 35V	C515	150919
1000UF 10V	C518	271228
1000UF 16V	C359, 360	271453
1000UF 25V	C516	152567
1000UF 35V	C402	271229
2200UF 25V	C424	157653

CM-14 MONITOR / CRT P.C.B. Component Layout

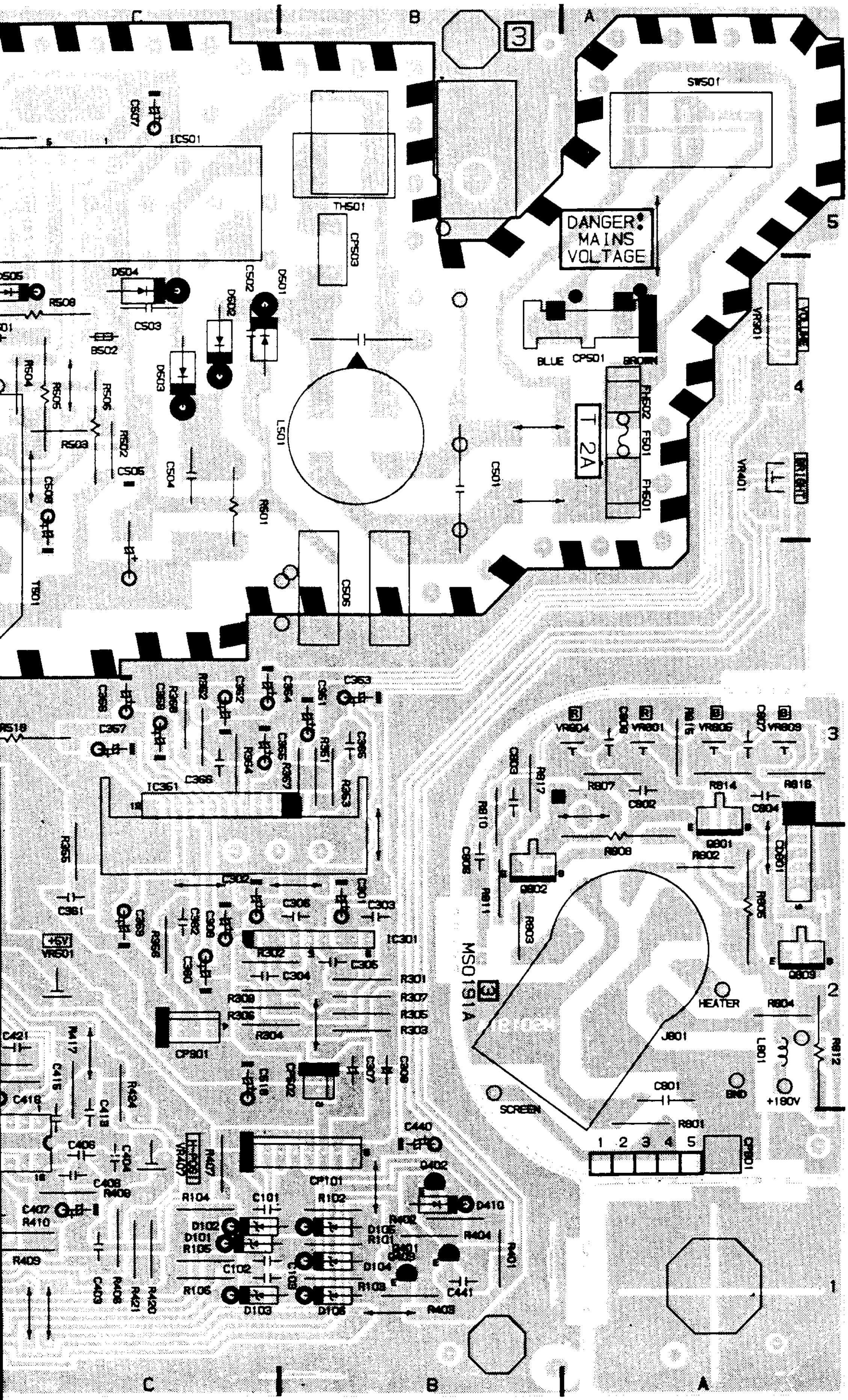

A
B
C
D
E
F
1
2
3
4
5
DANGER MAINS VOLTAGE
T 2A
SW501
VOLUME
VR901
BRIGHT
VR401
FH501
F501
FH502
CP501
BLUE
BROWN
C501
L501
TH501
CP503
IC501
C507
B503
D501
D502
D503
D504
D505
C502
C503
C504
C505
C506
C508
C509
C510
C511
C513
C514
C516
R501
R502
R503
R504
R505
R506
R507
R508
R509
B501
B502
B504
B505
B506
T501
D506
D507
D508
D509
D510
ICP501
ICP502
ICP503
IC502
R510
R511
R512
R513
R514
R515
R516
R517
R518
R519
Q602
Q603
Q604
Q605
Q606
C512
C515
C517
C519
FB401
HEATER
GND
180V
C430
C431
C432
C433
C439
D405
D406
D407
D411
R437
R438
R444
R445
R446
R427
R436
CP401
L401
T401
Q404
C402
V-HOLD
VR405
V-SIZE
VR406
H-HOLD
VR403
SUB BRIGHT
VR402
H-POSI
VR407
CP0001A
CP402
IC402
IC401
IC361
IC301
R302
C304
C305
C306
C303
C301
C302
C361
C362
C363
C364
C365
C366
C367
C368
C369
C360
R361
R362
R363
R364
R365
R366
R367
R368
+5V
VR501
CP301
CP502
C308
C307
C309
R301
R303
R304
R305
R306
R307
R308
R309
CP101
C101
C102
C103
D101
D102
D103
D104
D105
D106
R101
R102
R103
R104
R105
R106
D401
D402
D403
D410
Q401
Q402
C440
C441
R401
R402
R403
R404
R405
R406
R409
R410
R411
R412
R413
R414
R415
R416
R417
R418
R419
R420
R421
R423
R424
R425
R428
R429
R430
R431
R432
R433
R440
R441
R442
R446
R449
R450
R451
R452
R453
R459
R460
R462
R463
C401
C403
C404
C405
C406
C407
C408
C409
C410
C411
C413
C414
C415
C416
C417
C418
C419
C420
C421
C422
C423
C424
C425
C426
C427
C428
C444
C445
MS0191A
J801
SCREEN
HEATER
GND
+180V
L801
CP801
C801
R801
R802
R803
R804
R805
R806
R807
R808
R809
R810
R811
R812
R813
R814
R815
R816
R817
Q801
Q802
Q803
C802
C803
C804
C805
C806
C807
VR801
VR802
VR803
VR804
VR805
VR806
D801
1 2 3 4 5


F
1 2 3 4 5
E
D
5
4
3
2
1
C430
D407
R438
R444
B603
FB401
C510
R507
D505
C506
B601
HEATER
GND
D506
C511
R509
B604
ICP501
C514
180V
C432
C516
C513
B505
C431
D510
D508
ICP503
D509
C439
Q405
R437
D405
R513
B505
C512
C515
D607
R510
R512
Q504
C433
ICP502
D408
R514
Q505
C519
Q503
R511
Q502
R516
Q506
L401
C402
C517
R515
C419
C420
R446
CP401
IC502
VR405
V-HOLD
R427
R436
D411
R445
R480
R517
R429
R418
C414
D402
R462
C444
R439
R453
T401
R425
R438
R432
C428
C427
C416
R426
C434
IC401
Q404
R452
R440
R430
R451
C405
C411
C417
C445
C422
C423
C425
R412
R442
R463
D403
R413
C410
CP402
R415
R441
C426
R411
H-HOLD
SUB BRIGHT
C401
R414
R416
C408
V-SIZE
VR403
VR402
IC402
VR406
R419
CP0001A
D401
R423
R431
R449
F
E
D

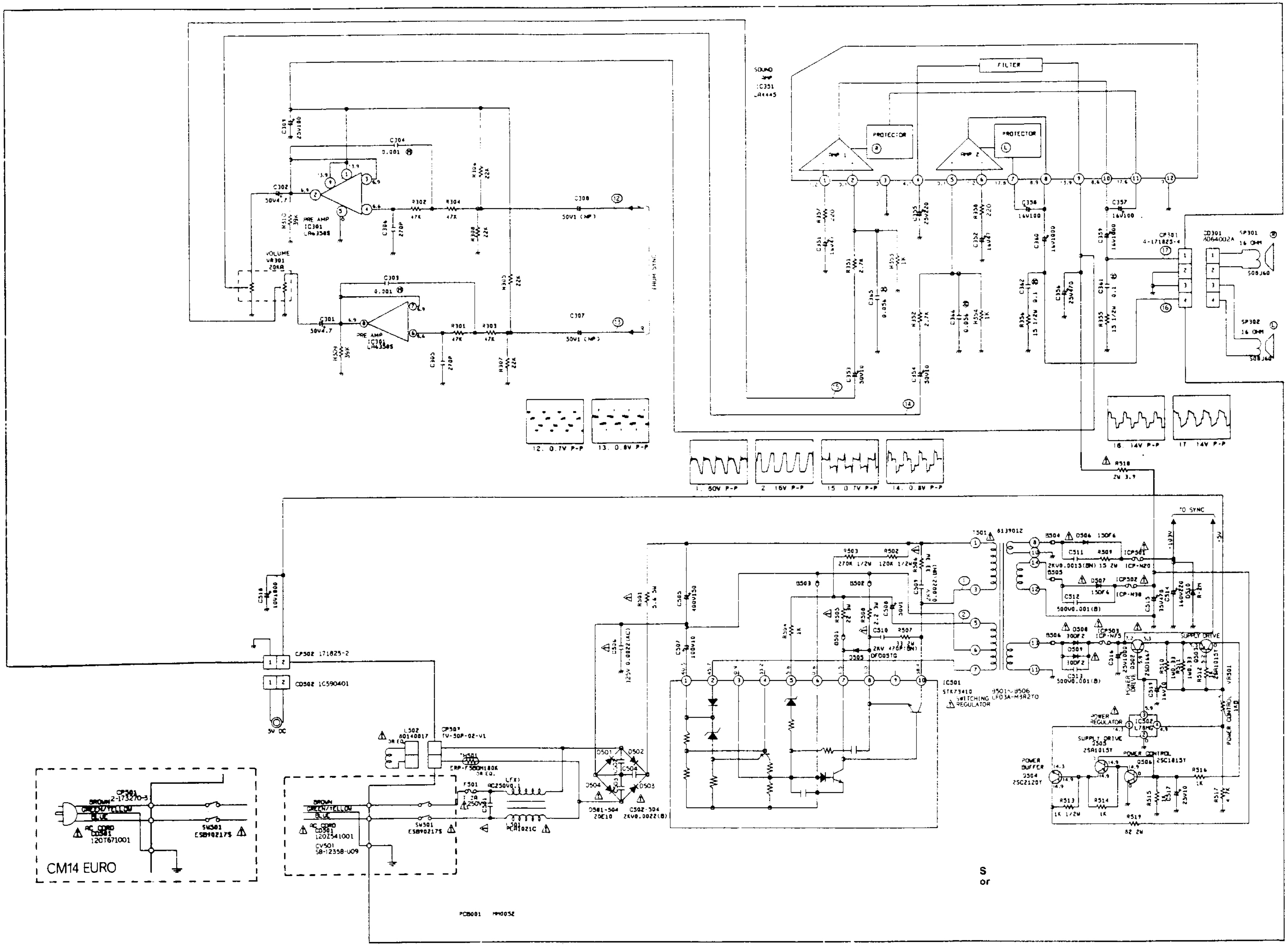
CM-14 MONITOR / CRT P.C.B. Component Layout


E
D
C
B
A
3
DANG
MAI
VOLT
D407
R444
IC501
B503
C507
TH501
CP503
C510
R507
D505
D504
R508
C503
C509
B501
B502
C502
D501
D502
D503
BLUE
CP501
D506
C511
R504
R505
R506
R503
R502
C505
C504
L501
R501
C501
T 2A
R509
B504
ICP501
C506
C514
C516
C513
B506
T501
C505
D510
D508
ICP503
D509
R519
B505
C512
C515
D607
R437
VR401
D405
C439
Q504
R513
R510
R512
R514
Q505
Q503
R511
C519
ICP502
R518
Q502
C402
Q506
R516
C517
R515
CP401
IC502
D411
R517
R439
R480
R432
R482
C358
C359
R368
R362
C362
C364
C361
C363
C357
C365
R364
R351
C366
R367
C366
R363
IC351
R365
C381
+5V
VR501
C302
C301
C306
C303
C369
C352
C308
C360
R366
IC301
R302
C305
C304
R301
R307
R308
R305
R306
R303
R304
CP301
CP302
C310
C307
C309
VR804
C803
R817
R807
R810
C808
Q802
R811
R803
MS0191A
SCREEN
R429
R418
C414
D402
R462
C421
R417
C444
R438
R463
R428
R425
C416
C418
C428
C427
IC401
R464
C419
R430
R461
R440
C405
C411
C406
C404
VR402
R407
C440
Q402
C422
C423
C425
D408
C410
C408
R406
R104
C101
CP101
R102
D410
R463
CP402
R413
C407
R410
C409
C401
R414
R415
IC402
R431
R409
C403
R408
R421
R420
D102
D101
R105
D105
R101
R402
R404
Q401
D104
C102
C103
R103
R401
C441
R106
D103
D106
R403
D401
R429
CP001A

RT P.C.B. Component Layout

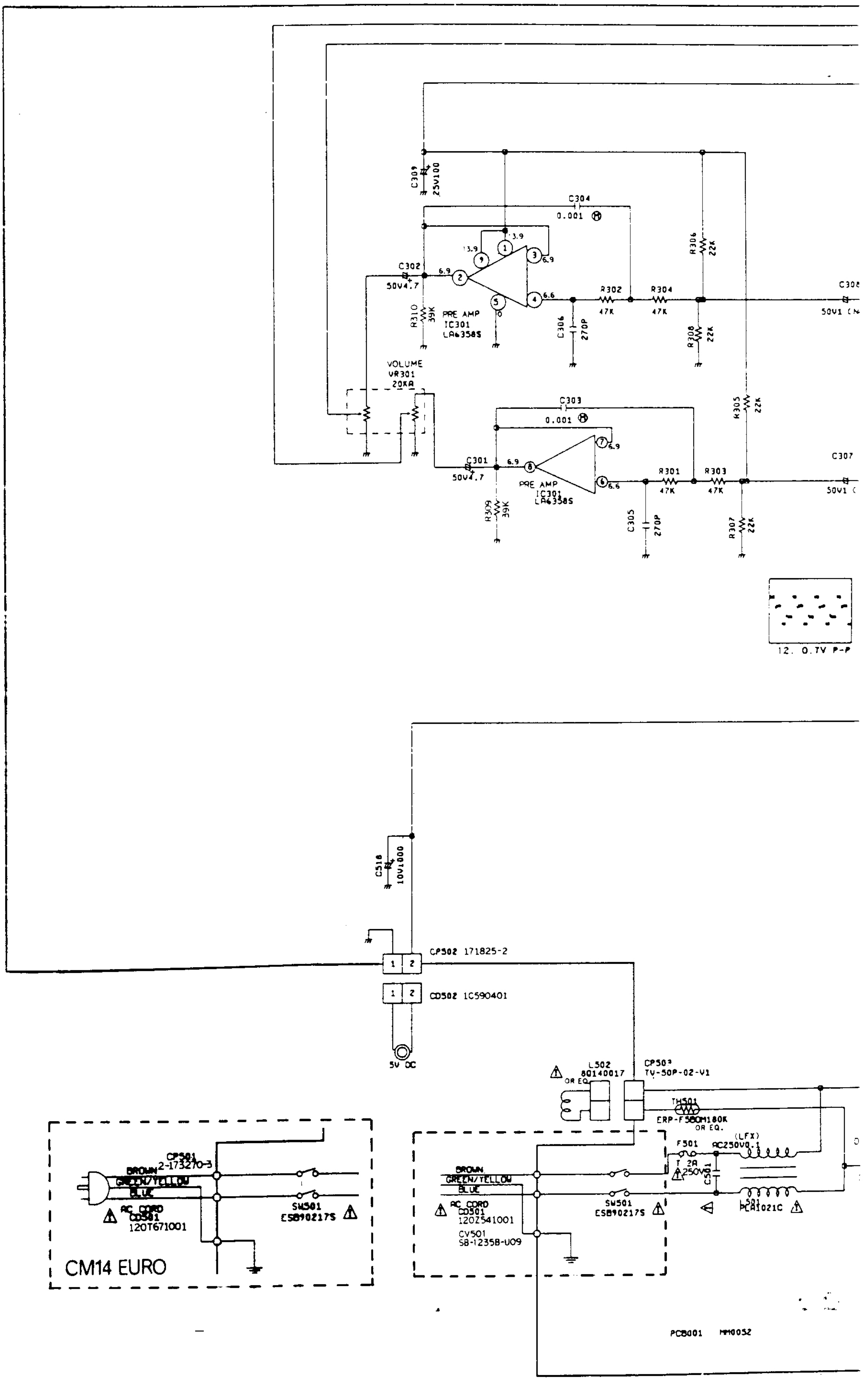

C
B
A
3
5
4
2
1
SW501
IC501
C507
TH501
CP503
DANGER MAINS VOLTAGE
D504
D505
R508
C503
C502
D501
D502
D503
B502
R504
R505
R506
R503
R502
C505
C504
C508
L501
R501
C501
BLUE
CP501
BROWN
FH502
F501
FH501
T 2A
T501
C506
VR901
VOLUME
VR401
BRIGHT
C353
C368
C359
R368
R362
C362
C364
C351
R351
C367
C355
R354
R357
R353
R518
C366
IC351
C365
R355
C302
C301
C303
C361
C309
C352
C308
C306
+5V
VR501
R356
C360
IC301
R302
C305
C304
R301
R307
R309
R306
R305
R304
R303
CP301
C421
R417
C416
C418
C415
R404
C307
C310
CP302
C309
C413
C406
C404
VR407
R407
C408
R403
C440
CP101
Q402
D410
C407
R410
R104
C101
R102
D102
D101
R105
D105
R101
R402
R404
Q401
C409
R401
D104
C441
R409
C102
C103
R103
R405
R106
D103
D106
C403
R408
R421
R420
VR804
C806
VR801
R815
VR805
C807
VR809
C803
R817
R807
C802
R814
C804
R816
R810
Q801
CD801
R808
R802
C805
Q802
R811
R803
R805
MS0191A
3
Q803
HEATER
R804
J801
L801
R812
C801
SCREEN
GND
+190V
R801
1 2 3 4 5
CP801

CM-14 POWER / SOUND SCHEMATIC DIAGRAM

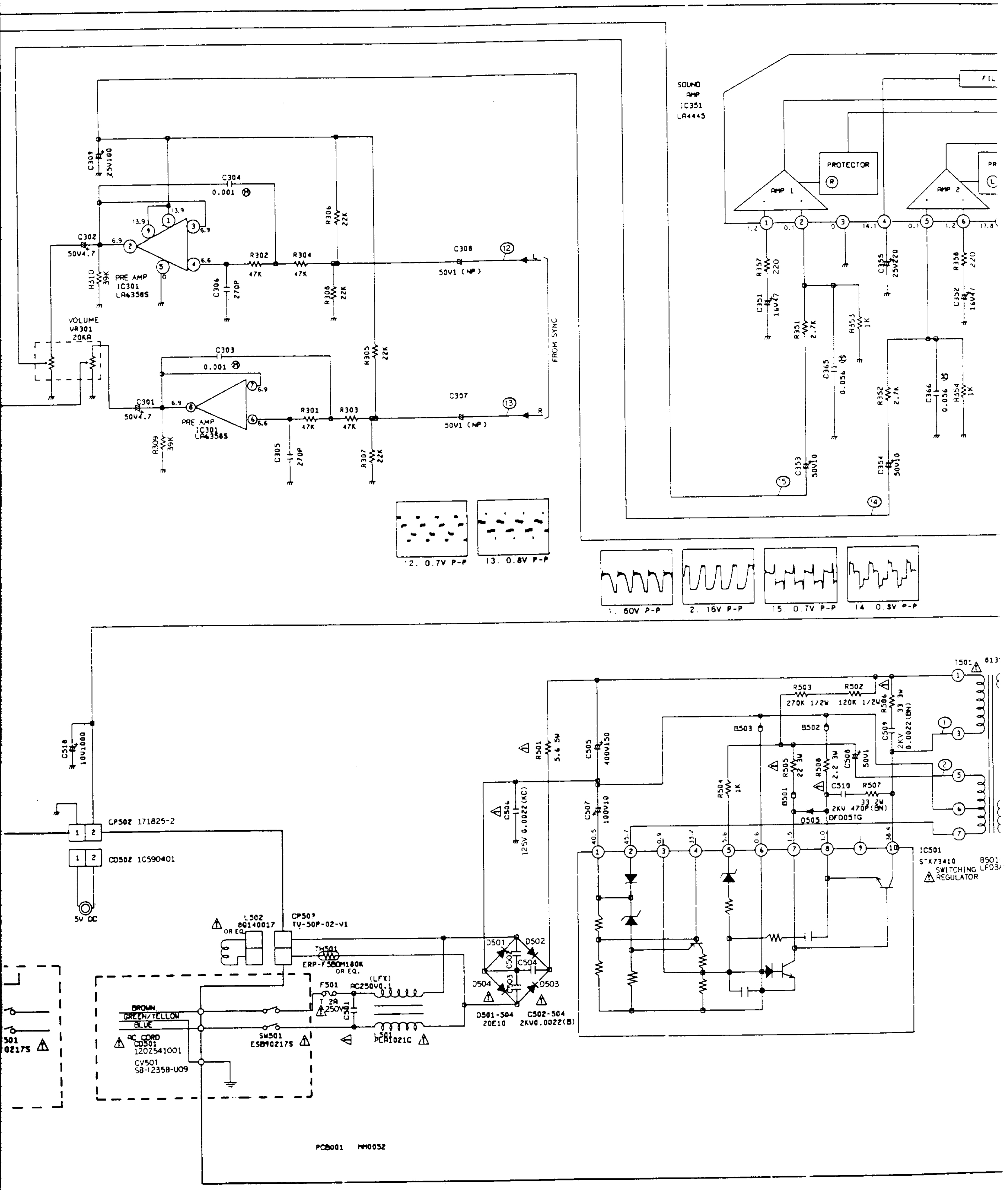

SOUND AMP IC351 LA4445
FILTER
PROTECTOR
AMP 1
AMP 2
PRE AMP IC301 LA6358S
VOLUME VR301 20KB
FROM SYNC
CP301 4-171825-4
CD301 A0640002A
SP301 16 OHM
SP302 16 OHM
12. 0.7V P-P
13. 0.8V P-P
1. 50V P-P
2. 16V P-P
15. 0.7V P-P
14. 0.8V P-P
16. 14V P-P
17. 14V P-P
TO SYNC
T501 6139012
IC501 STK73410
D501~D506 LFO3A-M3R2TO
SWITCHING REGULATOR
POWER REGULATOR
SUPPLY DRIVE
POWER DRIVE
POWER CONTROL
POWER BUFFER
CP502 171825-2
CD502 1C590401
5V DC
L502 80140017
CP507 TV-50P-02-V1
F501 2A 250V
SW501 ESB902175
AC CORD CD501 1202541001
CV501 SB-12358-U09
BROWN
GREEN/YELLOW
BLUE
CM14 EURO
CP501 2-173270-3
AC CORD CD501 1207671001
PCB001 MM0052

S
or

CM-14 POWER / SO

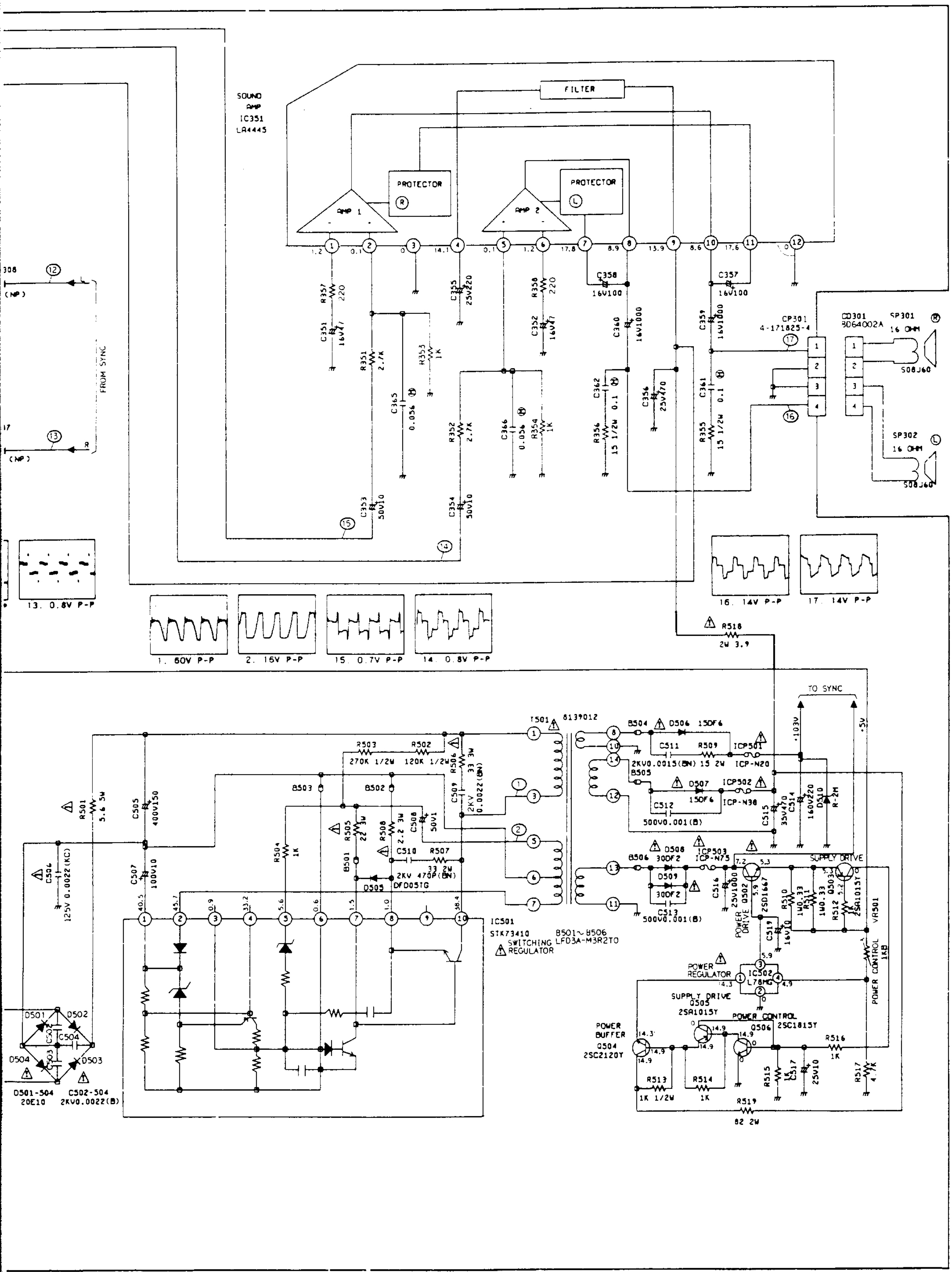

C309
25V100
C304
0.001
C302
50V4.7
R310
39K
PRE AMP
IC301
LA6358S
C306
270P
R302
47K
R304
47K
R306
22K
R308
22K
C308
50V1
VOLUME
VR301
20KA
C303
0.001
R305
22K
C301
50V4.7
PRE AMP
IC301
LA6358S
R309
39K
C305
270P
R301
47K
R303
47K
R307
22K
C307
50V1
12. 0.7V P-P
C518
10V1000
CP502 171825-2
CD502 1C590401
5V DC
L502
80140017
OR EQ.
CP503
TV-50P-02-V1
TH501
ERP-F5B0M180K
OR EQ.
F501
T 2A
250V
AC250V0.1
(LFX)
C501
L501
PCA1021C
BROWN
GREEN/YELLOW
BLUE
AC CORD
CD501
120Z541001
CV501
SB-1235B-U09
SW501
ESB90217S
CP501
2-173270-3
BROWN
GREEN/YELLOW
BLUE
AC CORD
CD501
120T671001
SW501
ESB90217S
CM14 EURO
PCB001
MM0052

CM-14 POWER / SOUND SCHEMATIC DIAGRAM



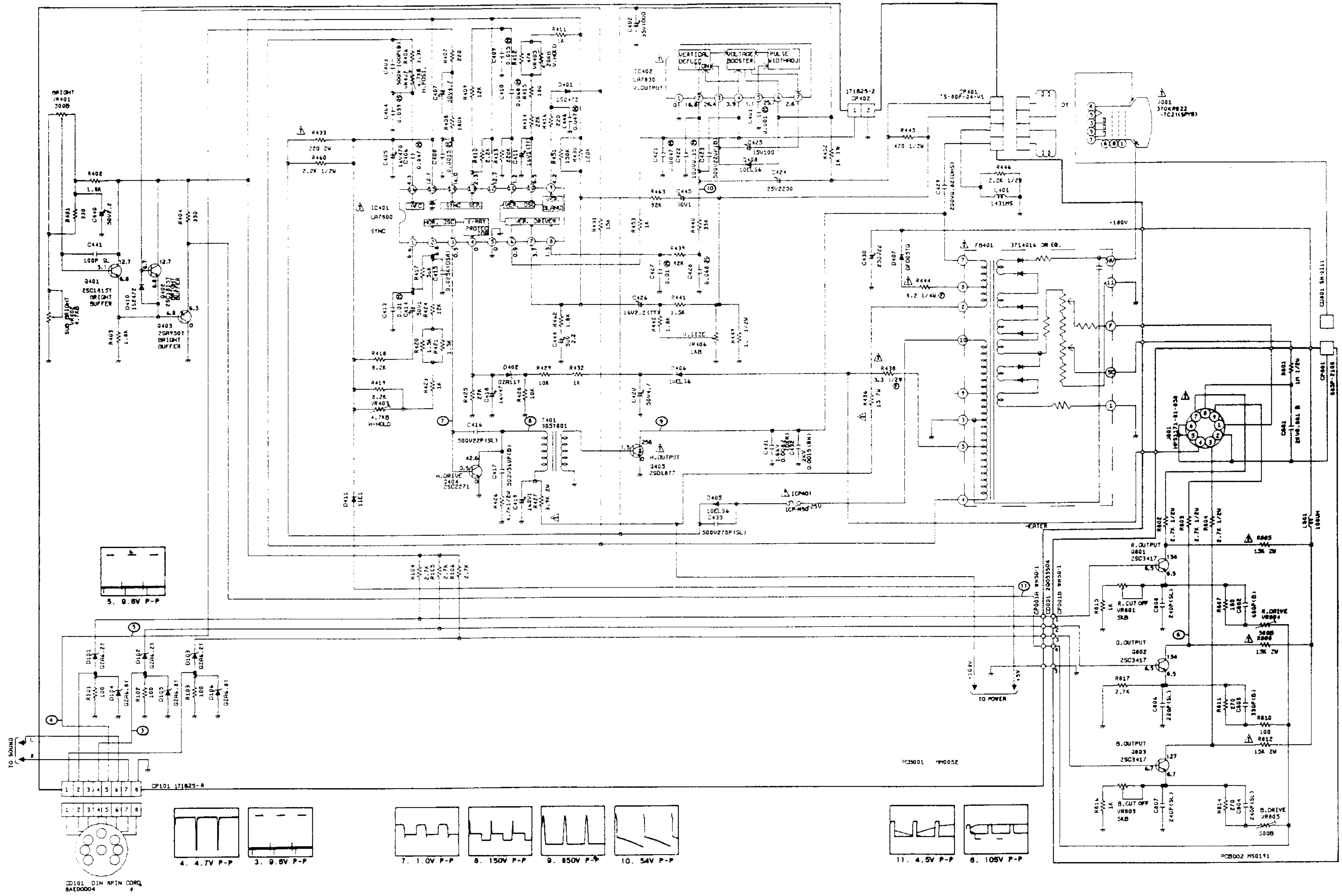
SOUND AMP IC351 LA4445
PROTECTOR
AMP 1
AMP 2
C309 25V100
C304 0.001
C302 50V4.7
R310 39K
PRE AMP IC301 LA6358S
R302 47K
R304 47K
R306 22K
R308 22K
C306 270P
C308 50V1 (NP)
VOLUME VR301 20KA
C303 0.001
C301 50V4.7
R309 39K
R301 47K
R303 47K
R305 22K
R307 22K
C305 270P
C307 50V1 (NP)
FROM SYNC
R357 220
C351 16V47
C355 25V220
R358 220
C352 16V47
R351 2.7K
R353 1K
C365 0.056
R352 2.7K
C364 0.056
R354 1K
C353 50V10
C354 50V10
12. 0.7V P-P
13. 0.8V P-P
1. 60V P-P
2. 16V P-P
15. 0.7V P-P
14. 0.8V P-P
C518 10V1000
CP502 171825-2
CD502 1C590401
5V DC
L502 8Q140017 OR EQ.
CP503 TV-50P-02-V1
TH501 ERP-F580M180K OR EQ.
F501 2A 250V
AC250V0.1 (LFX)
C501
L501 PLA1021C
BROWN
GREEN/YELLOW
BLUE
AC CORD CD501 120Z541001
CV501 SB-1235B-U09
SW501 ESB90217S
D501 D502 D503 D504
C502 C503 C504
D501-504 20E10
C502-504 2KV0.0022(B)
C506 125V 0.0022(KC)
R501 5.6 5W
C505 400V150
C507 100V10
R503 270K 1/2W
R502 120K 1/2W
R506 33 3W
C509 2KV 0.0022(BN)
B503
B502
B501
R504 1K
R505 22 3W
R508 2.2 3W
C508 50V1
C510 2KV 470P(BN)
R507 33 2W
D505 DF005TG
T501
IC501 STK73410 SWITCHING REGULATOR
PCB001 MM0052

OUND SCHEMATIC DIAGRAM

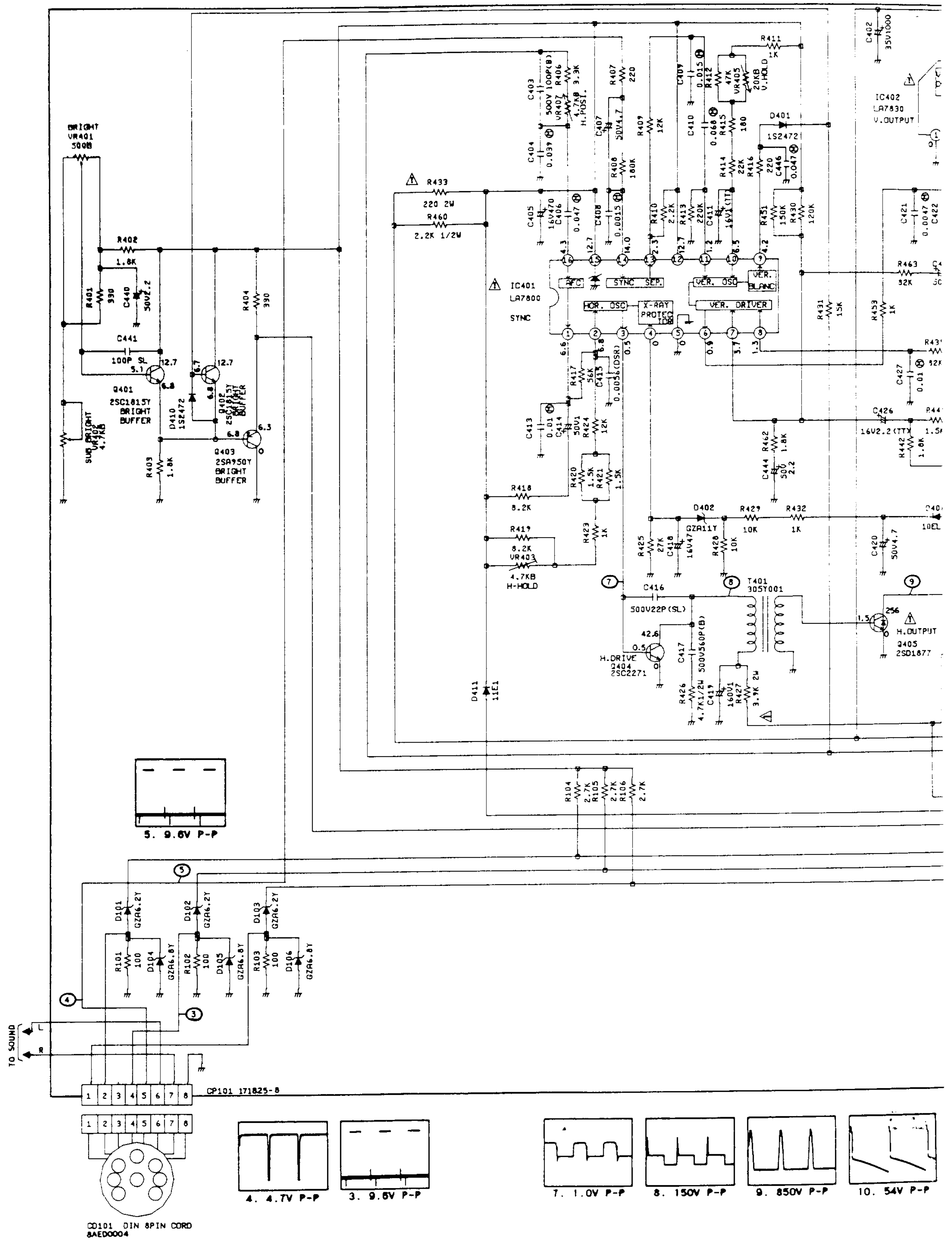


SOUND AMP
IC351
LA4445
FILTER
PROTECTOR
R
PROTECTOR
L
AMP 1
AMP 2
C358 16V100
C357 16V100
R357 220
C351 16V47
R351 2.7K
C365 0.056
R353 1K
C355 25V220
R358 220
C352 16V47
R352 2.7K
C366 0.056
R354 1K
C360 16V1000
C362 0.1
R356 15 1/2W
C356 25V470
C359 16V1000
C361 0.1
R355 15 1/2W
C353 50V10
C354 50V10
CP301
4-171825-4
CD301
8D64002A
SP301
16 OHM
SP302
16 OHM
S08J60
FROM SYNC
(NP)
12
13
14
15
16
17
13. 0.8V P-P
1. 60V P-P
2. 16V P-P
15. 0.7V P-P
14. 0.8V P-P
16. 14V P-P
17. 14V P-P
R518
2W 3.9
TO SYNC
-103V
-5V
T501
8139012
R503 270K 1/2W
R502 120K 1/2W
R506 33 3W
C509 2KV 0.0022(BN)
B503
B502
R501 5.6 5W
C505 400V150
C507 100V10
C506 125V 0.0022(KC)
R504 1K
R505 22 3W
R508 2.2 3W
C508 50V1
B501
C510 2KV 470P(BN)
R507 33 2W
D505 DFD05TG
IC501
STK73410
SWITCHING REGULATOR
B501~B506
LFD3A-M3R2T0
D501
D502
D503
D504
C503
C504
D501-504 20E10
C502-504 2KV0.0022(B)
B504
D506 150F6
C511 2KV0.0015(BN)
R509 15 2W
ICP501 ICP-N20
B505
D507 150F6
ICP502 ICP-N38
C512 500V0.001(B)
C515 35V470
C514 160V220
D510 R-2M
B506
D508 300F2
ICP503 ICP-N75
D509 300F2
C513 500V0.001(B)
C516 25V1000
Q502 2SD1667
POWER DRIVE
R510 1W0.33
R511 1W0.33
R512
Q503 2SA1015Y
SUPPLY DRIVE
VR501
POWER CONTROL 1KB
C519 16V10
POWER REGULATOR
IC502
L78MG
SUPPLY DRIVE
Q505
2SA1015Y
POWER CONTROL
Q506
2SC1815Y
POWER BUFFER
Q504
2SC2120Y
R513 1K 1/2W
R514 1K
R515 1K
C517 25V10
R516 1K
R517 4.7K
R519 82 2W

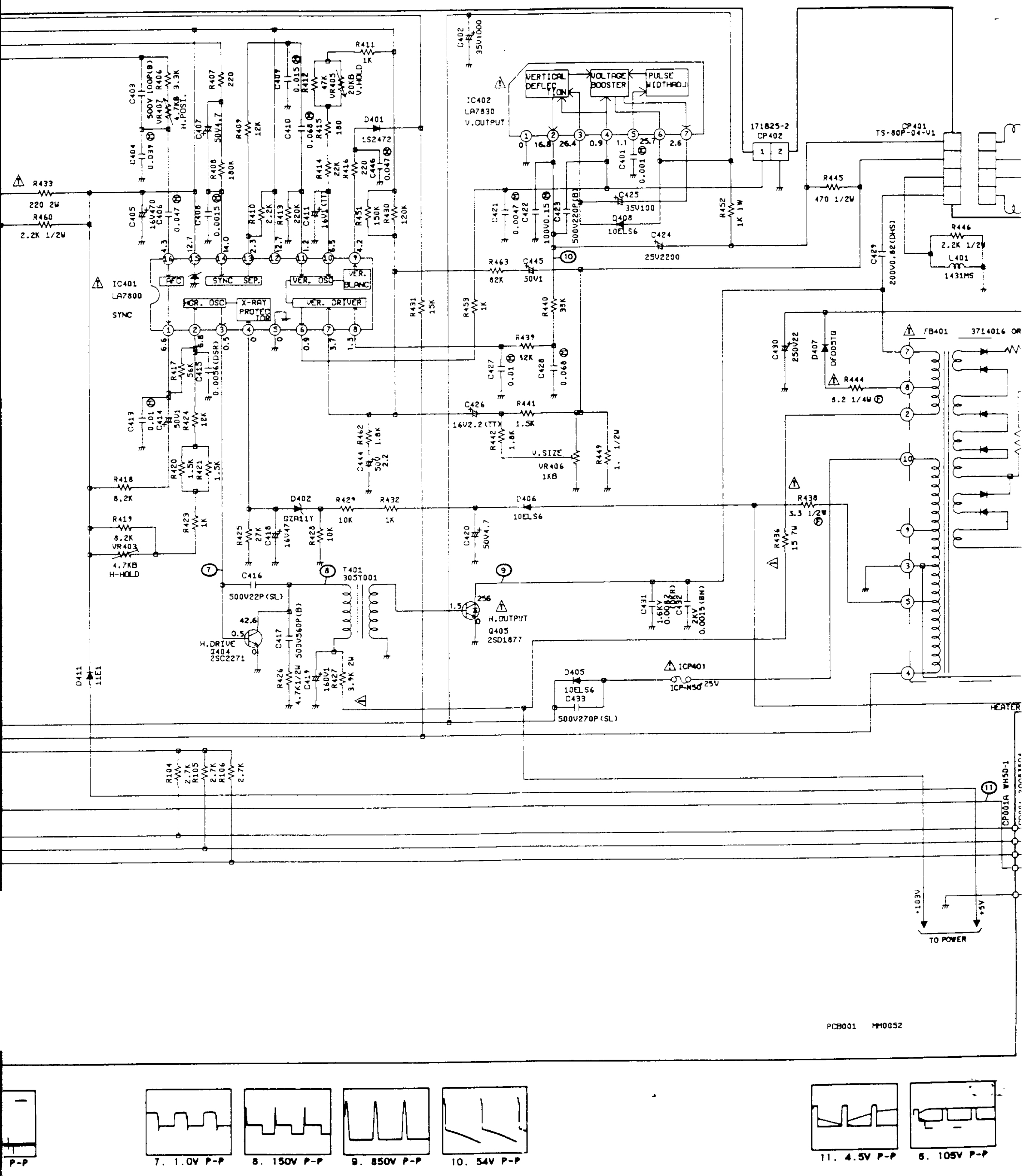
CM-14 MONITOR SCHEMATIC DIAGRAM


BRIGHT VR401 500B
Q401 2SC1815Y BRIGHT BUFFER
Q402 2SC1815Y BRIGHT BUFFER
Q403 2SA950Y BRIGHT BUFFER
D410 1S2472
SUB BRIGHT VR402 4.7KB
IC401 LA7800
SYNC
AFC
SYNC SEP.
HOR. OSC
X-RAY PROTECT
VER. OSC
BLANK
VER. DRIVER
H.POSI.
H-HOLD
VR403 4.7KB
V.HOLD
V.SIZE VR406 1KB
IC402 LA7830 V.OUTPUT
VERTICAL DEFLCO
VOLTAGE BOOSTER
PULSE WIDTH ADJ
H.DRIVE Q404 2SC2271
T401 305T001
H.OUTPUT Q405 2SD1877
D411 11E1
D402 GZA11Y
D405 10ELS4
D406 10ELS4
ICP401 ICP-N50
CP402 171825-2
CP401 TS-60P-04-V1
DY
J001 370KR622 -TC21(SPYB)
FB401 3714016 OR EQ.
CP801 865P-2108
CD801 SH-1111
J801 HPS1171-01-058
L801 100uH
R.OUTPUT Q801 2SC3417
G.OUTPUT Q802 2SC3417
B.OUTPUT Q803 2SC3417
R.CUT OFF VR801 5KB
B.CUT OFF VR803 5KB
G.DRIVE VR804 500B
B.DRIVE VR805 500B
CP001A WH50-1
CD001 2Q055504
CP001B WH50-1
TO POWER
+100V
+5V
+100V
HEATER
PCB001 MH0052
PCB002 MS0191
CP101 171825-8
CD101 DIN 8PIN CORD 8AED0004
TO SOUND
L
R
D101 GZA6.2Y
D102 GZA6.2Y
D103 GZA6.2Y
D104 GZA6.8Y
D105 GZA6.8Y
D106 GZA6.8Y
5. 9.6V P-P
4. 4.7V P-P
3. 9.6V P-P
7. 1.0V P-P
8. 150V P-P
9. 850V P-P
10. 54V P-P
11. 4.5V P-P
6. 105V P-P

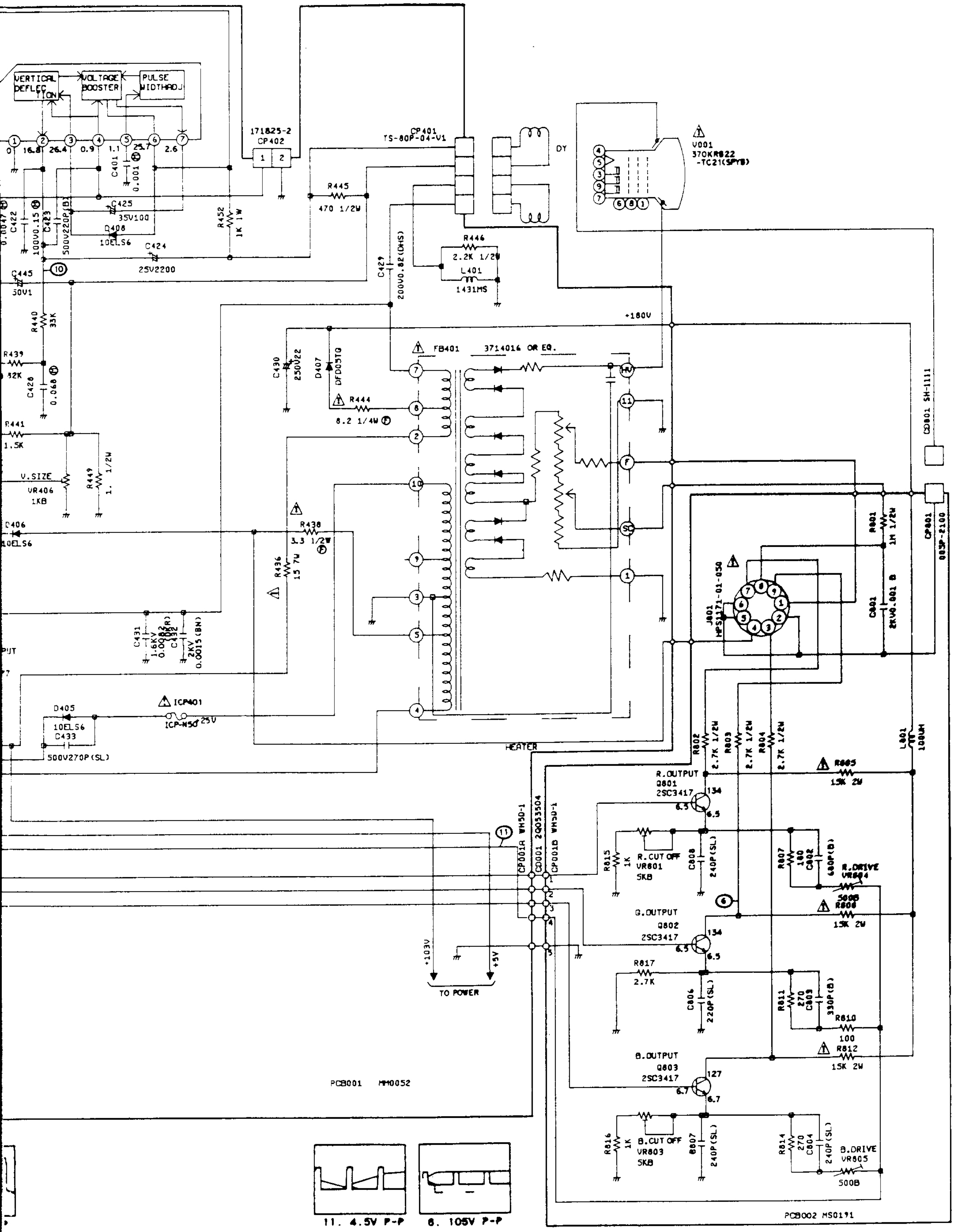
CM-14 MONITOR SC


BRIGHT VR401 500B
R402 1.8K
R401 330
C440 50V2.2
C441 100P SL
Q401 2SC1815Y BRIGHT BUFFER
Q402 2SC1815Y BRIGHT BUFFER
Q403 2SA950Y BRIGHT BUFFER
D410 1S2472
SUB BRIGHT VR402 4.7KB
R403 1.8K
R404 330
R433 220 2W
R460 2.2K 1/2W
IC401 LA7800 SYNC
AFC
SYNC SEP.
VER. OSC
VER. BLANC
HOR. OSC
X-RAY PROTECTOR
VER. DRIVER
C403 500V 100P(B)
R406 3.3K
VR407 4.7KB H.POSI.
R407 220
C404 0.039
C407 50V4.7
R408 180K
R409 12K
C409 0.015
R412 47K
VR405 20KB V.HOLD
R411 1K
C410 0.068
R415 180
D401 1S2472
R414 22K
R416 220
C446 0.047
C405 16V470
C406 0.047
C408 0.0015
R410 2.2K
R413 220K
C411 16V1 (TT)
R451 150K
R430 120K
R417 56K
C415 0.0056(DSR)
C413 0.01
C414 50V1
R424 12K
R420 1.5K
R421 1.5K
R418 8.2K
R419 8.2K
VR403 4.7KB H-HOLD
R423 1K
R431 15K
R462 1.8K
C444 50V2.2
D402 GZA11Y
R429 10K
R432 1K
R425 27K
C418 16V47
R428 10K
C416 500V22P(SL)
T401 305T001
H.DRIVE Q404 2SC2271
C417 500V560P(B)
R426 4.7K1/2W
C419 160V1
R427 3.9K 2W
D411 11E1
C402 35V1000
IC402 LA7830 V.OUTPUT
C421 0.0047
R463 32K
R453 1K
C427 0.01
C426 16V2.2(TT)
R442 1.8K
C420 50V4.7
H.OUTPUT Q405 2SD1877
R104 2.7K
R105 2.7K
R106 2.7K
D101 GZA6.2Y
D102 GZA6.2Y
D103 GZA6.2Y
R101 100
R102 100
R103 100
D104 GZA6.8Y
D105 GZA6.8Y
D106 GZA6.8Y
TO SOUND
L
R
CP101 171825-8
CD101 DIN 8PIN CORD 8AED0004
5. 9.6V P-P
4. 4.7V P-P
3. 9.6V P-P
7. 1.0V P-P
8. 150V P-P
9. 850V P-P
10. 54V P-P

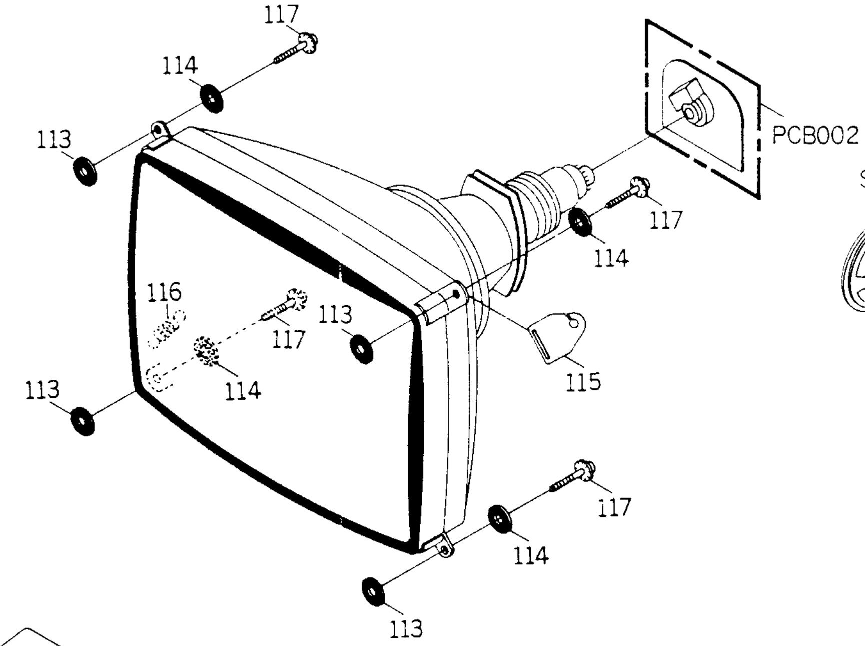
CM-14 MONITOR SCHEMATIC DIAGRAM


R433 220 2W
R460 2.2K 1/2W
C403 500V 100P(B)
R406 3.3K
VR407 4.7KB H.POSI.
R407 220
C409
0.015
R411 1K
R412 47K
VR405 20KB V.HOLD
C404 0.039
C407 50V4.7
R409 12K
C410 0.068
R415 180
D401 1S2472
R408 180K
R414 22K
R416 220
C446 0.047
C405 16V470
C406 0.047
C408 0.0015
R410 2.2K
R413 220K
C411 16V1(TT)
R451 150K
R430 120K
IC401 LA7800 SYNC
AFC
SYNC SEP.
VER. OSC
VER. BLANC
HOR. OSC
X-RAY PROTECTION
VER. DRIVER
R417 56K
C415 0.0056(DSR)
C413 0.01
C414 50V1
R424 12K
R420 1.5K
R421 1.5K
R418 8.2K
R419 8.2K
VR403 4.7KB H-HOLD
R423 1K
D411 11E1
C402 35V1000
IC402 LA7830 V.OUTPUT
VERTICAL DEFLECTION
VOLTAGE BOOSTER
PULSE WIDTHADJ
C401 0.001
C421 0.0047
C422 100V0.15
C423 500V220P(B)
C425 35V100
D408 10ELS6
C424 25V2200
R452 1K 1W
171825-2 CP402
CP401 TS-80P-04-V1
R445 470 1/2W
R446 2.2K 1/2W
L401 1431MS
C429 200V0.82(DHS)
R463 82K
C445 50V1
R431 15K
R453 1K
R440 33K
R439 82K
C427 0.01
C428 0.068
C426 16V2.2(TT)
R441 1.5K
R442 1.8K
V.SIZE VR406 1KB
R449 1 1/2W
C444 50V2.2
R462 1.8K
D402 GZA11Y
R429 10K
R432 1K
D406 10ELS6
R425 27K
C418 16V47
R428 10K
C420 50V4.7
C416 500V22P(SL)
T401 3057001
C417 500V560P(B)
H.DRIVE Q404 2SC2271
R426 4.7K1/2W
C419 160V1
R427 3.9K 2W
H.OUTPUT Q405 2SD1877
C431 1.6KV 0.0082(R)
C432 2KV 0.0015(BN)
D405 10ELS6
C433 500V270P(SL)
ICP401 ICP-N50 25V
C430 250V22
D407 DFD05TG
FB401 3714016
R444 8.2 1/4W
R438 3.3 1/2W
R436 15 7W
HEATER
R104 2.7K
R105 2.7K
R106 2.7K
CP001A WH5D-1
+103V
+5V
TO POWER
PCB001 MM0052
7. 1.0V P-P
8. 150V P-P
9. 850V P-P
10. 54V P-P
11. 4.5V P-P
6. 105V P-P

CHEMATIC DIAGRAM


VERTICAL DEFLEC TION
VOLTAGE BOOSTER
PULSE WIDTHADJ
0
16.8
26.4
0.9
1.1
25.7
2.6
171825-2
CP402
CP401
TS-80P-04-V1
DY
V001
370KR822
-TC21(SPYB)
C401 0.001
C422 100V0.15
C423 500V220P(B)
C425 35V100
D408 10ELS6
C424 25V2200
R452 1K 1W
R445 470 1/2W
R446 2.2K 1/2W
L401 1431MS
C429 200V0.82(DHS)
C445 50V1
R440 33K
R439 82K
C426 0.068
R441 1.5K
V.SIZE
VR406 1KB
R449 1. 1/2W
D406 10ELS6
+180V
FB401 3714016 OR EQ.
C430 250V22
D407 DFD05TG
R444 8.2 1/4W
R438 3.3 1/2W
R436 15 7W
C431 1.6KV 0.0082(R)
C432 2KV 0.0015(BN)
D405 10ELS6
C433 500V270P(SL)
ICP401 ICP-N50 25V
HEATER
HV
F
SC
CD801 SH-1111
CP801 083P-2100
R801 1M 1/2W
C801 2KV0.001 B
J801 HPS1171-01-050
R802 2.7K 1/2W
R803 2.7K 1/2W
R804 2.7K 1/2W
L801 100UH
R805 15K 2W
R.OUTPUT Q801 2SC3417
134
6.5
R815 1K
R.CUT OFF VR801 5KB
C808 240P(SL)
R807 180
C802 680P(B)
R.DRIVE VR804 500B
R808 15K 2W
G.OUTPUT Q802 2SC3417
R817 2.7K
C806 220P(SL)
R811 270
C803 330P(B)
R810 100
R812 15K 2W
B.OUTPUT Q803 2SC3417
127
6.7
R816 1K
B.CUT OFF VR803 5KB
C807 240P(SL)
R814 270
C804 240P(SL)
B.DRIVE VR805 500B
CP001A WH50-1
CD001 2Q053504
CP001B WH50-1
+103V
+5V
TO POWER
PCB001 MM0052
PCB002 MS0191
11. 4.5V P-P
6. 105V P-P

CM-14 CABINET EXPLODED VIEW


117
114
113
PCB002
117
114
116
117
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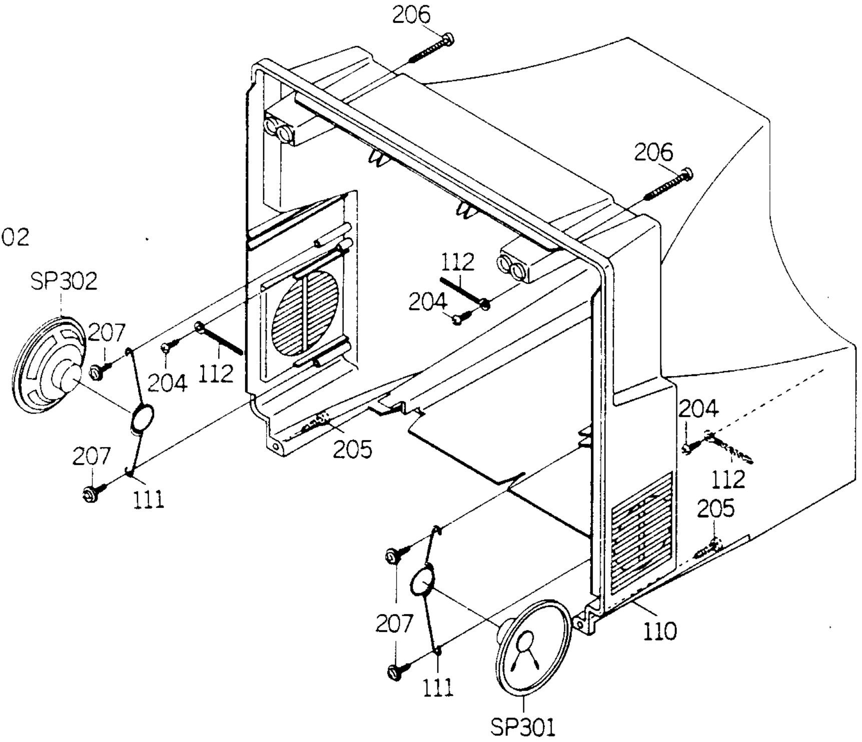
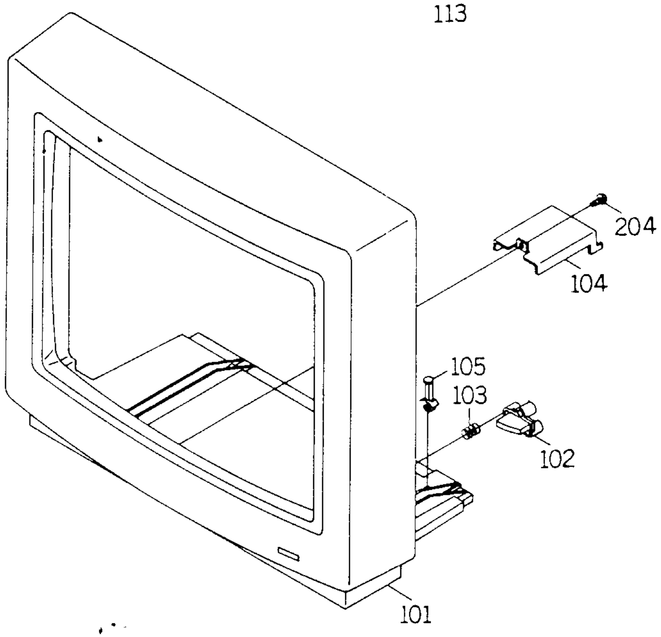
114
115
113
117
114
113


206
206
SP302
207
112
204
204
112
205
204
207
111
112
205
207
110
111
SP301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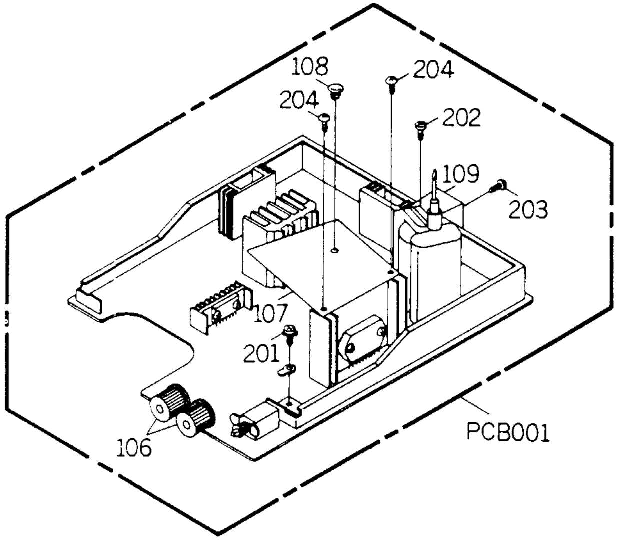
105
103
102
101


108
204
204
202
109
203
107
201
106
PCB001

CM14 CABINET PARTS LIST

Ref. No.	Description	Part No.
Cabinet Parts		
101	Cabinet Front Ass'y	271155
	Cabinet Front	
	Plate Brand	
102	Button Power	271413
103	Spring Button (B)	271414
104	Angle Curl Cord	271415
105	Stopper PCB	271191
106	Knob Control	271175
107	Shield Trans	271192
108	Card Spacer KGPS8R	271193
109	Angle FBT	
110	Cabinet Back Ass'y	271156
	Cabinet Back	
	Sheet Rating	
111	Spring Speaker	271197
112	Cord Clamp No. PEC-034-0	
113	Sheet CRT Support	
114	Sheet CRT Support	
115	Plate Earth Wire	
116	Spring CRT Earth	